

A STUDY OF SOME SOCIAL FACTORS IN PERCEPTION

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CHAPTER I

I. PROBLEM

That individuals may react differently to the same stimulus situations has become a truism in psychology. There are cases in which such internal factors as drive, attitude, affect, or emotional upset play the dominating part in determining the experiences and subsequent behavior. The concern of this study in social psychology is to note some social factors participating in the production of such differential response on the part of individuals.

Social psychology has studied individual differences in *response* to a social environment, but it has never recognized that each one of us *perceives* this environment in terms of his own personal habits of perceiving; and that cultural groups may differ from one another in behavior, because of fundamental differences in their ways of perceiving social situations. In the following paragraphs some cases reported by cultural anthropologists, revealing such differential group effects, will be reviewed. The psychological problem which they raise is the starting point for the experiments reported in this paper.

II. A REVIEW OF SOME OBSERVATIONS OF CULTURAL ANTHROPOLOGISTS

Whatever society we take, no matter how primitive or developed, simple or complicated, we find standards, norms, conventions, customs, and values regulating to a great extent the conduct, and shaping the mentalities, likes and dislikes of its members along economic, aesthetic, social, moral, political and other lines.

The individual acquires a certain set of norms from childhood on, no matter whether he wishes to do so or not, and *whether he is conscious of the fact or not*. Sapir has given a subtle analysis of this point in a recent symposium (37). These norms determine to a considerable extent the individual's ideas of good or bad, right or wrong, beautiful or ugly, and likewise his perceptual tendencies; *e.g., which aspects of a field of stimulation he will accentuate and which he will ignore*. For instance (to use the illustration cited by Sapir), a foreigner looking at the activities of a "primitive" group will often single out certain aspects that will be passed unnoticed by

the natives as unimportant, or he will fail to notice certain parts that will be in the foreground from the point of view of the natives.

The norms may vary from society to society and from time to time. These variations may be comparatively slight within a given range, as is the case with societies belonging to the same culture (e.g., Western culture), or they may be astoundingly great, as is the case with societies belonging to different cultures. The variation in norms and in perceiving, thinking, and reacting, may be so great that the norms appear stupid, and contrary to all notions of "common sense," to a person whose thinking and behavior are regulated by norms of a different culture.

Some concrete cases showing wide differences from the norms of Western culture will show the point clearly. In order to emphasize the fact that these wide variations in norms are not restricted to the generally accepted variations in taste, fashion, social etiquette, standards, and manners of living, highly complicated aesthetic forms, and other affective phenomena alone, but that they are observed in cases relating to more basic psychological categories, the illustrations are chosen from the fields of space and time perception and experience of sense-quality.

We may start with a case of time reckoning. Radcliffe-Brown (34) reports:

"In the jungles of the Andamans it is possible to recognize a distinct succession of odours during a considerable part of the year as one after another the commoner trees and lianas come into flower. . . . The Andamanese have therefore adopted an original method of marking the different periods of the year by means of the odoriferous flowers that are in bloom at different times. *Their calendar is a calendar of scents.*" (Emphasis ours.)

Here we see odors serving as *reference points* for time reckoning in place of the astronomical events so widely used. As Radcliffe-Brown explains, the odors play an important role, connected with magic, in the life of the Andamans. Therefore they are very sensitive to odors.

Different objects or events may be chosen to serve as reference points for time reckoning. Leona Cope (10) gives some interesting cases:

"The Indian seems vaguely aware of the discrepancy between his lunar reckoning and solar year. Many tribes have no way of correcting their year count. In the calendars which have only twelve months, the Indians may unconsciously lengthen a month

when it does not tally with the event for which it is named, or they may insert another period. That the discrepancy was felt is shown by frequent references in the literature of the Indians to discussion and quarrels about which month it is or ought to be at a given time. The arguments apparently continue in such cases until, *through a comparison with the natural phenomena, matters are set right.*" (10, p. 137). (Emphasis ours.)

In another case sticks, standing for astronomical events, serve to supply reference points. "Often when the Indians agreed on a meeting at a particular time, they arranged bundles of sticks, from which they destroyed one for each day or night as it passed. When the last stick was gone they knew the appointed time had come. This method seems to have been common in the Southeast Woodlands and the Southwest." (10, p. 124).

A very striking case of variation in the experiencing of similarity has been observed by Malinowski. From his study of the Trobriands, Malinowski (27) reports that the idea of resemblance between parents and offspring, or between children of the same parents, is controlled by strict social norms, which controvert evidence and our expectations in two respects.

First, resemblance to the father is considered "natural, right and proper. . . . Such similarity is always assumed and affirmed to exist." But it is a great offense to hint that a child resembles its mother or any of its maternal kinfolk. "It is a phrase of serious bad language to say 'Thy face is thy sister's,' which is the worst combination of kinship similarity."

Second, it is a dogma, with almost the strength of a taboo, that even brothers do not resemble one another, although each is said to be exactly like the father. Malinowski relates an incident illustrative of this. When he commented on the striking likeness of two brothers, "there came such a hush over all the assembly, while the brother present withdrew abruptly and the company was half-embarrassed, half-offended at this breach of custom." In another case, five sons of a chief were said to be exactly like the father. When Malinowski "pointed out that this similarity to the father implied similarity among each other, such a heresy was indignantly repudiated." (27, pp. 87-92).

Here we see the influence of a taboo removing a perceptual relationship that might have been experienced otherwise, and a positive norm emphasizing a similarity which might not otherwise have been noticed.

The observations of the anthropological field workers *indicate that there is no strict finality* about the psychological color pyramid. *Cultural norms may determine at least slightly different color pyramids for different groups of people*, showing once more that there is no such thing as a generalized "normal adult human psychology." A quotation from Boas and some cases from other field observers will make the point clear.

"For instance, it has been observed that colors are classified according to their similarities in quite distinct groups, without any accompanying differences in the ability to differentiate shades of color. What we call green or blue are often combined under some such term as 'gall-like color,' or yellow and green are combined into one concept, which may be 'young-leaves color.' The importance of the fact that in thought and speech these color-names convey the impression of quite different groups of sensations can hardly be over-rated." (5, p. 199). To give a concrete case, Margaret Mead reports of groups whom she studied, "Their color classifications are so different that they saw yellow, olive-green, blue-green, gray and lavender as variations of one color." (28, p. 638). Likewise Wallis reports: "Not infrequently the savage *ignores* distinctions observed by us or cross-sections our distinctions. This frequently happens in color designations. The Ashantis have distinct names for the colors black, red, and white. The term *black* is also used for *any dark color*, such as blue, purple, brown, etc., while the term red does duty for pink, orange and yellow." (38, p. 421).

From customs, traditions, and values which standardize our social attitudes one could furnish innumerable striking cases. But we shall restrict ourselves to a single example.

"Sombre colors and depressed feelings are closely connected in our minds, although not in those of peoples of foreign culture. Noise seems inappropriate in a place of sadness, although among primitive people the loud wail of the mourner is a natural expression of grief." (5, p. 228).

In such a group it would show lack of understanding and be almost abnormal if one kept quiet and did not participate in the wailing. The famous Japanese smile at situations where the Westerner would show distress is pertinent in this connection. Therefore, there may be a great deal of truth in the statement of Benedict (4) that "the definition of abnormality is to a great extent culturally determined," which follows as a corollary of the cultural determination of norms.

As any person who has observed two different cultures will agree, we could multiply these examples indefinitely. These are not weird and exceptional cases. They are articulate examples of differences in outlook due to variations in cultural norms. Neither are they anecdotes from the fond observations of curiosity seekers. To an individual who is brought up in accordance with a particular sort of norm about time, color resemblance, or family resemblance, these experiences are as "natural" as Arabic numerals are to us.¹ On the other hand, many norms or reference points observed in Western culture may look strange to a person who has not been brought up in it.

These variations in norms raise the problem whether the minds of primitive peoples operate in the same or in a different way from those brought up in Western culture. Some authorities like Levy-Bruhl think the primitive mind is in the "pre-logical" stage. This concept is futile, for when we examine the facts closely, the nucleus of all perceiving and thinking lies in established norms or reference points. What seemed pre-logical or illogical at first sight, ceases to be so. The whole problem is reduced to the relativity of established norms.

Reference points may change in the same individual. Some recent studies on attitudes (2) have verified the common observation that a person in this culture may give altogether opposite judgments about the same question. The same person says that he is opposed to playing cards and that he is *not* opposed to playing cards. If we take this rigidly and do not notice the connections in which they are given, these judgments appear illogical. But when we note the connections in which they are given, we see beyond the apparent contradiction. *As a member* of a certain church he is opposed to playing cards, but *as an individual* he has no objection, indicating two different reference points. In the same way, even the case Malinowski cites, which may look so absurd at first glance, may reduce itself to the existence of two sets of frames of reference. In both cases the culture provides the major premises. In one case it is the established tradition which dictates that a man resembles his father, and hence this sort of relationship is sought for and even assumed.

¹ There is a profitable discussion of the development of number concepts in C. H. Judd's *Psychology of Social Institutions* (21), which is appropriate in this connection for the fact that man did not find the numbers we use today, but developed them in the course of long history.

To secure objectivity in studying these social psychological matters, the social psychologist or sociologist has to acquire a certain "distance" from the norms which are implanted in him as a member of a group; otherwise his judgments will not be anything more than a collection of normative verdicts.

Now we are prepared to raise our problem in a more specific form. Since the variations in customs, attitudes, fashions, and standards can be summarized partly in terms of the relativity of social norms or frames of reference, the problem becomes essentially: *What is the psychological basis of these norms or frames of reference, and how do they work?* The specific task of this study becomes a psychological study of frames of reference. It is not the writer's aim to reach a short-cut generalization concerning the extremely difficult problem of the psychological basis of social norms. The task he sets for himself is to survey the results of some major psychological experiments having a bearing on the concept of reference points and to demonstrate experimentally the way in which the conclusions derived from these studies may be profitably extended to the formulation of problems in social psychology. Therefore, the work claims only to be an approach, which may be one of the steps toward a psychological explanation of the functioning of social norms.

If social psychology is to be psychological, it has to base itself on the results of experimental psychology and thus connect itself with the main bulk of psychology. Unfortunately this has not been the case with social psychology for the most part. It may be sufficient for the cultural anthropologist and sociologist to show the variations in individuals due to differences in culture and let it go at that. But it is just *at this point* that the main task of the social psychologist begins. It is his task to study the genetic development of these social and cultural effects in the individual, the perceptual problem of how the individual responds to the stimulus situations which involve social factors, and the learning problem as to how they become organized in him.

Already some real progress has been made towards a sound social psychology in the work of Piaget (30, 31). Tracing the transition from the predominantly autistic stage to the "logical" stage by following the language development of the child in a natural setting, he has shown us the *development of "communicable," logical thinking*, which becomes a problem of social psychology. For, as Piaget points out, what is considered *socially* logical, chiefly con-

sists of sticking consistently to a *point of view* throughout, and these *points of view* are the socially accepted norms, which become also norms for the child through cooperation with others and through imposition on the child of definite responsibilities after he passes a certain age. In the "Moral Judgment of the Child" (32) Piaget shows how the child, who does not at first draw a line between himself and his environment, whose behavior follows chiefly the "pleasure principle," and who at the start does not see that there are *rules of the game*, comes to realize that there are rules of the game if he wants to play with others, and that he stands in *certain relationships* to others, implying definite responsibilities. Such contributions make the development of logical thinking and the development of moral judgment into genuine psychological problems.

III. A REVIEW OF SOME EXPERIMENTAL FACTS IN PSYCHOLOGY

If one reviews experimental results from many different laboratories over a long period of time with the concept of reference point, or frame of reference, in mind, one cannot help noticing a convergence of findings. A brief review of these results is the special task of this section.

Before presenting these, it will be a useful introduction to mention another line of experiment, the work of Külpe and his followers on abstraction. We refer to the experiments in Külpe's laboratory beginning in 1900, on the influence of *Aufgabe* (task or instruction) on perception of stimuli presented (24). In these experiments he tachistoscopically presented to his subjects different stimuli, such as printed syllables, about which different aspects or "dimensions" could be reported; e.g., the *number* of letters involved, the *locations* of the colors, or the *total pattern* composed by them. Külpe found that more items were noted and more correct judgments were made by the subject about that aspect of the stimuli which was called for in the *Aufgabe*. In other words, individuals notice more fully and more in detail the aspects of the stimulus-field that they set themselves to see or that they are set to see by instructions. Subsequently Yokoyama (6) and Chapman (9) verified Külpe's results. All these experiments indicate that "the efficiency of report for all tasks is lower under an indefinite *Aufgabe* than under a definite instruction."

The set or attitude plays an important part in the field of perceptual organization, picking up certain parts in the field of stimu-

lation as reference points. This is especially true in cases where the field of stimulation is not well structured. This is well illustrated in the following passage from Köhler:

"There are cases in which all attempts to destroy, in actual analysis, a given form in favor of a certain other form are in vain. But distribute the furniture of a room in an irregular manner through this room; you will have rather solid and stable units, the single objects, but no equally stable and firm *groups* will be formed spontaneously with those objects as members. You observe that one group formation is easily displaced by another, depending upon slight changes of conditions, probably in yourself. It is evident that, under such circumstances, the *influence of changes in the subjective attitude* towards the field will be much higher than in the case of the solid units or stable groups. Even forces of no peculiar intensity will now be strong enough to produce new groups in a field which—with the exception of the objects in it—does not resist very much because its interior tendencies of group formation are too weak." (23, p. 155). (Second emphasis ours.)

Such cases are of practical value in social psychology. When we observe with historical perspective, we notice that different people living in the same geographical area, facing the same nature, at different periods, may have, as we have seen, different sorts of time and space classifications, because different parts of nature were "standardized" as their frames of reference.

In the following paragraphs a brief historical review of the concept of reference points (or frames of reference) in experimental psychology will be given. The relationship implied in reference points is at the basis of the experiments reported in this study. "Reference point" is not a hypothetical concept. We find it involved in the comparatively simple forms of perception such as localization of a point on the skin and in visual perception of the localization of a short line. We find it involved in judgment, in psychophysics proper, in affectivity, and in personality, as some recent studies show. Let us review them briefly.

Henri studied localization on the skin over a period of years, 1892–1897. He carried on his experiment at the Sorbonne first in 1892–1894, under the direction of Binet, and continued his experiments at Leipzig in 1894. Among his subjects were Külpe, Judd, Meumann, and Kiesow. He concluded that there are certain definite places that *form a frame* of localization. Spots are localized nearer these points of reference. The errors of localization take

place accordingly. In Henri's own words, "*presque toujours l'erreur de localisation est commise dans la direction des points de repère que le sujet a employés pour localiser le contact.*" (18, p. 177). (Emphasis in the original.)

Henri carried the work further. In his dissertation at Göttingen (1897), he reports that when the subject uses one reference point (*point de repère* or *Anhaltspunkt*) within a cutaneous area, there appears a *constancy* in the direction of errors. With the shift of *Anhaltspunkte* there appears a corresponding shift in the direction of the errors of localization. This work is so basic in localization that it seems necessary to quote Henri at some length in connection with his description of the *variations in the error of localization with the shifts of reference points* (*Anhaltspunkte*).

"Wenn man die Lokalisationsfehler betrachtet, so fällt sofort eine Konstanz in der Richtung der Fehler auf; in der grossen Mehrzahl der Fälle ist der Punkt zu nahe an irgend einer hervorragenden Stelle (Leiste, Knöchel, Rand, Gelenk, etc.) angegeben, und wenn die Versuchsperson für einen Punkt immer dieselben *Anhaltspunkte* braucht, so entsteht eine Konstanz in der Richtung der Fehler. Es giebt aber Punkte, für die es keine konstante Richtung der Fehler giebt; diese sind Punkte, welche die Versuchsperson in Bezug auf verschiedene *Anhaltspunkte* lokalisiert. Wenn z. B. der Punkt in der Mitte des Handrückens liegt, so schätzt die Versuchsperson manchmal die Entfernung zum Handgelenke, manchmal aber zu den Metacarpalköpfen oder zu den Sehnen der Finger, daher wird der Punkt in manchen Fällen zu nahe zum Handgelenke, in anderen Fällen zu nahe an die Finger verlegt. Im allgemeinen wird die Richtung des begangenen Fehlers durch die Unterschätzung der Distanz des Punktes von gewissen *Anhaltspunkte* bestimmt." (17, pp. 37–38).

In subjective preferences we find the establishment of a *standard or reference point*, which is *peculiar to each individual*. Wells found this in an experiment in which he asked his subjects to arrange a series of pictures in order according to their preferences. Wells sums up the point thus: "If A and B arranged 10 pieces of music in order of preference, the *orders would center about each individual's own standard*; but if A, B, C, D, etc., arranged ten graduated weights, the orders would theoretically all center about a common standard, the *objective order* of heaviness." (39, p. 172). (Emphasis ours.)

Hollingworth found the *establishment of a median value* in the comparison of sizes. "In the experiment on sensible discrimination

we become adapted to the median value of the series, tend to expect it, to assimilate all other values toward it, and to greater or less degree to substitute it for them." (19, p. 468). (Emphasis ours.)

Gestalt psychologists furnish an infinite number of instances of *Verankerung* (frame of reference) by their insistence on the *member-character* of a part within an organized structure. Wertheimer (40) in 1912 demonstrated that a line is experienced as horizontal or vertical in reference to the position of other things in the field of stimulation. Thus if the observer's visual field were objectively slanted by means of a mirror, a similarly slanted objective line tended to appear vertical, indicating that the position of an object is not perceived in respect to that object alone, but by its relation to the whole organized field.

Koffka made a special issue of the notions of "member-character" and "Verankerungspunkte" (anchorage points), and the importance of the ground for the figure. He summarized the facts and the argument on this point by saying, "all this means that a definite single position exists only within a fixed spatial level. If the conditions for the formation of such a level are absent, localization is no longer possible; for just as the level grows unstable, so does the single point within it." (22, p. 570). (Emphasis ours.)

In discussing the ground (in relation to figure) he states, "... the ground has a very important function of its own; it serves as a general level (niveau) upon which the figure appears. Now figure and ground form a structure, consequently the former cannot be independent of the latter. On the contrary, the quality of the figure must be largely determined by the general level upon which it appears. This is a universal fact, observed in such products of culture as fashion and style. The same dress which is not only smart, but nice to look at, almost a thing of beauty, may become intolerable after the mode has passed." (22, p. 566).

The ground is especially important in social psychology. Studies on social facilitation would gain much more sense if the subtle relationship between figure and ground were taken into consideration. For example, when two people are talking in a public place, their conversation and behavior are tinged by the properties of the whole "atmosphere."

In a recent article Lewin (26) shows the strength of the tendency to be "anchored" to a frame of reference ("ground"), of which the most important part is the social group to which one belongs. He also shows how every action one performs has some specific "background" and is determined by that background.

Beebe-Center (3), who has done comprehensive work on affectivity, reports the relativity of affective judgments with a striking case. The observers were to judge pairs of stimuli. They were instructed to state in the case of each pair not only which stimulus was the more pleasant, but whether each was pleasant, indifferent or unpleasant. One observer reported that both stimuli were indifferent, yet one was more pleasant than the other. A sheer case of "illogic"—the same thing, indifferent and pleasant at the same time! The experimenter investigated the case further. He found that the observer had visualized a scale in his mind. The upper part represented pleasantness, the middle part (not the middle point) indifference, and the lower part unpleasantness. He placed the two stimuli in the middle within the indifference range, so reported "indifferent." Yet within the indifference range, one stimulus was above; i.e., nearer to the unpleasantness range, and accordingly he reported it as pleasanter. So the "illogic" turns out to be a perfectly natural case of *member-character*. In relation to the whole scale, both are indifferent; in relation to each other, one is more pleasant. Therefore, it is perfectly good logic, if the frames of reference are taken into consideration. This relational effect is not restricted to a few individual cases of affectivity alone. It applies to a whole array of facts that come under hedonic contrast.

The notion of the level of reference is becoming effectively utilized in the field of personality. Hoppe's (20) work using the concepts of aspiration level (*Anspruchsniveau*) and ego level, and Frank's (13) more quantitative work on the basis of these concepts are already steps in this direction.

From the point of view of its bearing on our own experiments, the general conclusion reached on the basis of the recent work on "absolute judgment" or single stimuli in psychophysics is important. This method goes back to Fechner, and to Woodworth and Thorndike's (42) joint work. Wever and Zener (41) revived it recently, and subsequent work has been carried on by Fernberger (12), Bressler (7), Pratt (33), and others. These investigations show that in psychophysical judgments the use of a standard stimulus is not a necessary condition to permit the observer to give a judgment about any stimulus in the series. After a few rounds of presentation, the observers establish a scale. The position of a stimulus is judged against the background of that scale. Again we see a basic field of work in which frame of reference is involved.

In closing this review a case reported by Wever and Zener (41) is pertinent. Using the method of "absolute judgment" or single

stimuli, they gave an observer a "light" series of weights (84, 88, 92, 96 and 100 grams); after this series became an "established" scale for the observer, they suddenly introduced a "heavy" series (92, 96, 100, 104 and 108 grams). "The effect of the first series on the judgments of the second was quite evident for 20 or 25 presentations; i.e., for four or five rounds judgments of the "heavy" *pre-dominated* for all the stimuli; from this point on, however, the judgments showed a redistribution conforming to the second stimulus series." In other words, when for a stimulus (e.g., 96 grams) the "light series" (84-100 grams) is the frame of reference, the stimulus is experienced as heavy, but when the same stimulus is related to a heavy series, it is experienced as light.

From this review one may conclude that a frame of reference is involved not only in perception or localization, but also in other psychological phenomena. Perhaps it may be involved in all psychological phenomena. If facts support this view, as there is reason to believe as the problem now stands, the psychologist will find in this tendency to experience things in a *relational* way, a sound foundation on which to build his social psychology.

After surveying several observations from the anthropological field workers, we had come to the conclusion that the diversity of patterns in different cultures may be expressed partly as differences in norms, or frames of reference. In the review that we have just made we have found the frame of reference a very important concept, the implications of which ran through many experimental findings. The relativity of norms in the social field on the one hand, and the implications of the frame of reference in psychological phenomena on the other hand, form the background for our experiments. They are useful for us at least in furnishing hypotheses for experimental test.

CHAPTER II

THE AUTO-KINETIC EFFECT

ITS POSSIBILITIES FOR OUR PROBLEM

In our review of experimental data, it was seen that perception, judgment, and affectivity were relational matters, involving frames of reference. We also saw that psychological judgments may be made without the necessity of a formal standard stimulus in the experimental setting, because whether we formally introduce a standard stimulus or not, the subject experiences things in relation and thus establishes a scale, a level, or a frame of reference of his own.

We may now raise the problem: What will an individual do when he is placed in an objectively unstable situation in which all basis of comparison as far as the external field of stimulation is concerned is absent? What will the subject do when external reference points are eliminated? Will he give a hodge-podge of erratic judgments? Or will he establish his own points of reference? Consistent results in any direction under this situation may be taken as the index of a subjectively produced frame of reference.

What will a group of people do in the same unstable situation? Will it give a hodge-podge of judgments? Or will it establish its own frame of reference? Will it produce its own norm so as to perceive the unstable situation in some sort of order? If consistent effects are produced by such social factors as suggestion, and if the group establishes a standard or a reference point peculiar to itself, then we may say that we have at least the rudiments of the formation of a norm by a group.

With these considerations clearly in mind, our first task has been to find situations that can be structured this or that way by a definite subjective set. From among other possible experimental situations, we have preferred to use autokinetic movement and affectively neutral passages of prose. They meet our requirements. Autokinetic movement affords an especially good opportunity to test out the questions raised in the last paragraphs. In a dark room, when there is no objective basis of comparison, a single small light seems to move, and may seem to move in any direction. If you present the point of light repeatedly to a subject, he may see the light appearing at different places in the room each time—especially if

the subject does not know the distance between himself and the light. The autokinetic effect can be obtained very easily. In a completely dark room a single point of light cannot be localized definitely at any place, because there is nothing in reference to which you can locate it. The effect appears even when the person looking at the light knows perfectly well that the light is not moving at all.

This is not a new phenomenon (1), nor is it a laboratory artifact. It is older than experimental psychology. It was first reported by astronomers. Humboldt observed the phenomenon while looking at the stars from "a mountain peak 10,700 feet above sea level during the course of some investigations in Teneriffe." He thought there were real movements. Through the contradictions in direction reported by the individuals facing such a light at the same time, Schweizer proved that it was not a physical movement. It was first called "Sternschwanken." Aubert (1887) coined the name "autokinetic sensation" (Autokinetische Empfindung). Charpentier, Exner, Bourdon, Carr (8), and Adams (1) have reported studies on the autokinetic effects. It is described likewise by Külpe (25) and Sanford (36). Peterson (29), Guilford and Dallenbach (16), and Guilford (15) reported their studies. Their chief concern was to find the nature of autokinetic movement.

Autokinetic effect is not an artifact. It is produced whenever a stimulating object lacks a frame of reference. Several authors have advanced theories about the nature of the autokinetic effect. Among these we may mention the central theory (Gould and Aubert), the retinal theory (Exner—circles of action in the retina), eye-movement theory (Hoppe), eye-strain theory (Carr), and streaming theory (Carr, Guilford, and Dallenbach). The nature of the autokinetic movement is still a controversial problem. The nature of the autokinetic effect is immaterial for our purposes. But during long hours spent in taking the judgments of the subjects in the dark room certain facts came to our attention over and over again. On that basis it must be said that any adequate explanation of the nature of the autokinetic movement must take the following facts into account:

1. The smaller and the fainter the light is, the more readily the "illusion" is produced (this fact is stated by early investigators);
2. The more uncertain the subject is about the distance between himself and the light the more readily the "illusion" is produced;

3. The addition of one more light disturbs the illusion. If several visible objects are added, the illusion is destroyed, and there is stability in the field of stimulation;

4. Noises and sounds in the neighborhood act as disturbing factors for the illusion—making any solely retinal or peripheral explanation improbable.

We have used the autokinetic effect in two ways to test out the questions raised on page 17.

(1) We have studied the *extent* of movement experienced by the observer under different conditions:

- (a) When alone;
- (b) When in a group situation;
- (c) When brought into a group situation after being experimented upon when alone;
- (d) When experimented upon alone after being in a group situation.

(2) We have studied the effect of suggestion on the *direction* of movement experienced by the observer.

The first is designated as the *range* experiment and the second as the *direction* experiment.

APPARATUS

The experiments were carried on in a sound- and light-proof room. The general disposition of the apparatus is shown in the accompanying plan. (Figure 1.) The stimulus light was mounted on a table, 85 cm. from the floor at one end of the experimental room. The subjects were seated at the opposite end of the room, 5 meters from the stimulus light.

In order that the observers might get no idea about the source of light and the experimental set-up, there was always a large four-section screen between the observer and the light whenever the room was illuminated. The screen was pushed aside just after the room was completely darkened. Observers never saw the set-up around the stimulus light. This precaution was taken so as not to give any idea about a possible objective range for distance.

The essential parts of the apparatus were the stimulus light and the timing apparatus. (See Figures 1 and 2.)

The point of light (the stimulus light) was exposed through a tiny hole, 1 mm. in diameter, in one end of a tight metal box 7.5 cm. in diameter and 25 cm. long. The source of light was a small radio dial bulb burning at approximately normal brilliance on 2.5 volts

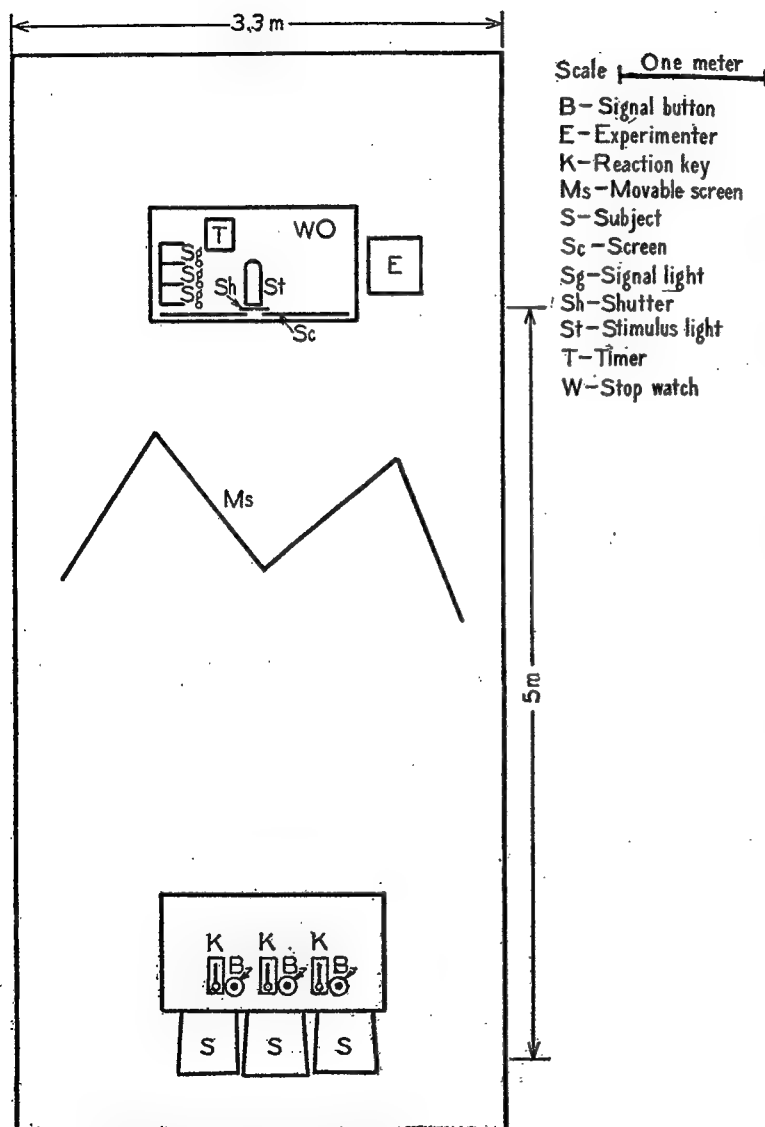


Figure 1. Plan of experimental room

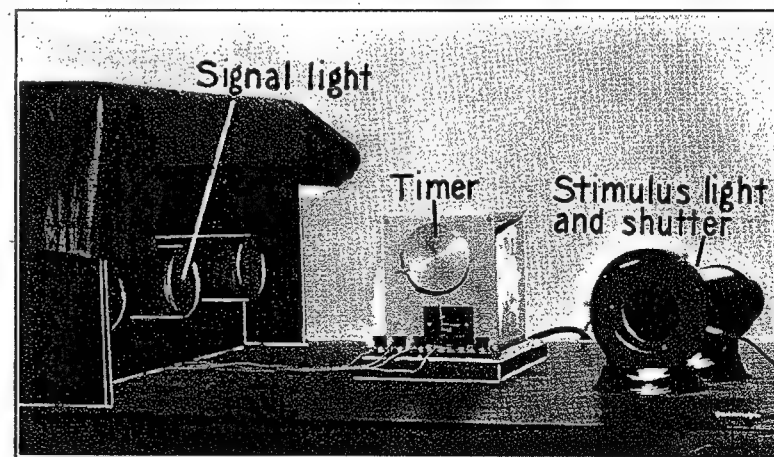
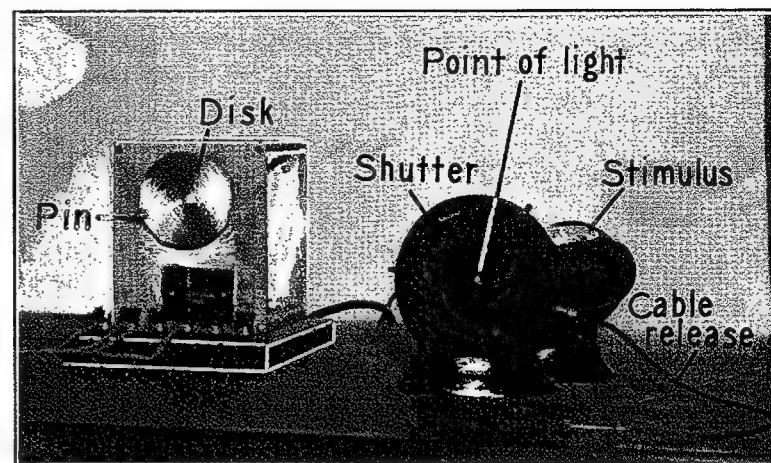


FIGURE 2. (Above) Apparatus for individual trials with screen removed. (Below) Apparatus for group experiments with screen removed.

supplied by a small transformer. Two thicknesses of tissue paper located 20 cm. from the bulb served to diffuse the light. A manually operated photographic shutter stood on the table immediately in front of the point of light and was operated by the experimenter by means of a long cable release.

The subject was instructed to press his reaction key as soon as he had seen the (autokinetic) movement (as will be noted in the description of the procedure later.) This set the disk of the timing device¹ in motion by releasing a magnetic catch. This disk was driven by a Telechron synchronous motor through a clutch. Normally it was held stationary and was arranged to make one complete revolution when released. An adjustable pin on the edge of the disk struck a small lever (giving a soft click) at a predetermined time (*i.e.*, 2 seconds) following the reaction of the subject. The experimenter closed the shutter as soon as the timer had clicked.

In case no movement was seen within 30 seconds following the exposure of the light, the experimenter closed the shutter, and recorded the "distance" as zero. The 30 seconds' duration was determined by a stop-watch with luminous dial lying on the table in front of the experimenter.

In the group experiments the apparatus was the same, with the following necessary additions. In place of the single reaction key, three keys were mounted on the table 30 cm. apart. The connections were so arranged that each key closed the circuit to the timing apparatus; thus the pressing of any one of the reaction keys would release the disk, so that the light disappeared 2 seconds later. The chairs for the subjects were set behind the table close to each other. On successive group sessions, the subjects took the same chairs.

To identify the subjects as they gave their individual judgments in complete darkness, a signal system was necessary. This consisted of push-buttons mounted beside each reaction key and connected with three colored signal lights (yellow, red, green, respectively), so concealed from the vision of the subjects by a partition as to be visible only to the experimenter. These signal lights were exceedingly dim, and of course made nothing in the room visible to the subjects while the experiment was going on.

Because of the fact that the autokinetic effect is produced more readily if the distance between the subject and the point of light is

¹ I wish to express my thanks to Mr. Ralph Gerbrands, mechanic of the Harvard Psychological Laboratory, for the design and construction of the timing apparatus used throughout the experiment.

not known, the comparatively long distance of 5 meters was used. Also because of the fact that the smaller the light the more quickly the "illusion" of movement is produced, a tiny hole of 1 mm. was chosen. These conditions are important, especially for group experiments, because if in different groups one member continually reports zero movement, while another presses the key to indicate the experience of movement, the stimulus-field is *not unstable enough* and hence not differentiating between subjective states of individuals in the group. The inspection of results shows that these difficulties were avoided in the experimental set-up.

SUBJECTS

The subjects in the range experiments were obtained through the employment offices of Columbia University, Teachers College and New York University. All the subjects in the autokinetic experiments were male undergraduate and graduate students, ages ranging between 19-30. Those were suitable who did not use eyeglasses and who had not majored in psychology. (If they knew anything about the autokinetic effect there was no point in using them.) We may say that they were psychologically naive subjects.

There were 19 subjects in the first range experiment, 4 in the second (intensive) range experiment, and 40 subjects in the group experiments. One hundred judgments were obtained from each subject in each experimental session. In the direction experiment (p. 43) there were 36 subjects (20, 6, 10).

The procedure will be described in connection with each specific experiment.

CHAPTER III

I. RANGE EXPERIMENTS

We have seen that the work done on the method of single stimuli shows that the subjects establish a scale even though a standard stimulus is lacking; and every stimulus presented is judged according to its experienced place in the scale.

We presented the same single stimulus (the point of light) 100 times. Of course the subject does not know that the stimulus is always the same. How will he distribute his judgments of the distances which the light moved? An objective scale for judgment is lacking. The question is, will the subject distribute his judgments in a haphazard way because of the lack of an objective basis for comparison? Or will he himself furnish a scale, and a reference point on that scale subjectively, and distribute his judgments around that reference point? In the physical absence of an anchorage point will an anchorage be produced subjectively?

What will a group of individuals do when they collectively face such a situation, which lacks physical basis for a standard or norm? If a common scale and a common norm are produced for the group as a whole, this will be very significant as an approach to the question suggested by our review of anthropological field cases.

RANGE EXPERIMENT—PART I—(INDIVIDUAL)

There were 19 subjects in this experiment.

The observer was seated at a table on which was the key which operates the timing device. The following instructions were given:

"When the room is completely dark, I shall give you the signal READY, and then show you a point of light. After a short time the light will start to move. As soon as you see it move, press the key. A few seconds later the light will disappear. Then tell me the distance it moved. Try to make your estimates as accurate as possible."

These instructions summarize the general procedure. Then the subject's head was placed in a Stoelting head-rest, to do away at least with the head movement. The signal "Ready" was given before each exposure by a pencil tap on the table. If the observer did not press the key within 30 seconds, the light was covered and the distance was recorded as zero. This happened seldom. After the

observer pressed the key, an exposure time of 2 seconds was used in all experiments. Generally the key was pressed by the subjects not more than 5 seconds after the exposure. The subject reported orally the distance moved. The experimenter recorded each judgment as soon as it was spoken by the subject, writing each judgment on a separate sheet of a small paper pad. 100 judgments were obtained from each observer. The subjects reported their estimated distances in inches (or fractions of inches).

At the end of the experiment the subjects were asked to fill out a sheet with these questions:

1. Was it difficult to estimate the distance? If Yes, give the reasons.
2. Show with a diagram the way the light moved.
3. Did you try to find some method of your own, so that you could make your judgments more accurate?

Some of these introspections will be briefly reported later, because they further illustrate the questions raised.

Results: The actual data, the distances reported, are given in the frequency distributions in the Appendix, Table XVI, pages 55-56. The range, mode, median, Q, and P.E. (mdn.) were computed for every 100 judgments. (See Table I.)

TABLE I
RANGE EXPERIMENT I

Subject	Range	Mode	Median	Q	P.E. (Mdn.)
1	12 (0-12)	4	4.80	1.35	± .17
2	9 (4-13)	6	7.89	1.55	± .19
3	3 ($\frac{1}{2}$ -3 $\frac{1}{2}$)	1 $\frac{1}{2}$	1.72	0.51	± .06
4	6 (2-8)	6	5.45	1.04	± .13
5	6 (0-6)	3	3.45	.97	± .12
6	2 (1-3)	2	2.16	.53	± .07
7	13 (2-15)	8	8.39	1.70	± .21
8	11 (5-16)	9	9.62	1.32	± .16
9	2 $\frac{1}{2}$ ($\frac{1}{2}$ -3)	2	1.37	.65	± .08
10	$\frac{3}{8}$ (0- $\frac{3}{8}$)	$\frac{3}{8}$	0.36	.11	± .01
11	10 (4-14)	8	8.70	1.66	± .21
12	4 $\frac{1}{2}$ (.5-5)	2	2.61	1.01	± .13
13	6 (0-6)	2	2.96	1.05	± .13
14	9 (1-10)	4	5.21	1.28	± .16
15	2 $\frac{1}{2}$ ($\frac{1}{4}$ -3)	$\frac{1}{2}$	0.78	.37	± .05
16	4 (2-6)	3	4.12	.72	± .09
17	8 (0-8)	1	2.36	1.08	± .13
18	6 (2-8)	6	6.25	.78	± .10
19	1 $\frac{1}{2}$ ($\frac{1}{4}$ -1 $\frac{1}{2}$)	$\frac{1}{2}$	0.80	.21	± .03

One will note that the frequency tables show that these distributions approach normality with different degrees of skewness, in

some cases positive and in some negative. The *median* value may deviate in various degrees from the middle of the range. These points are not of particular interest for the present problem, though such an analysis may be of special interest to the psychophysicist. For our problem the important fact in these results is that the *subjects subjectively establish a range and a point within that range which is peculiar to the individual* and which may differ from the range and the median point established by other individuals. Among these 19 subjects the shortest range is 1 $\frac{1}{2}$, extending from $\frac{1}{4}$ to 1 $\frac{1}{2}$ inches; the greatest range is 13, extending from 2 to 15 inches. The minimum median is .36 and the maximum is 9.62 inches. The variation of ranges and medians within these distances holds only for our specific conditions—exposure time, distance between light and observer; and diameter of the light. The facts summarized above may be readily seen in the bar diagram on p. 26.

The introspections give qualitative support to the conclusions summarized above. The answers filled in to the question: Was it difficult to estimate the distance? show that they feel the lack of reference points. Let us quote some of the representative ones:

1. "Darkness left no guide for distance."
2. "No set position from which to judge how far."
3. "Didn't know direction it would move."
4. "Lack of visible neighboring objects."
5. "No fixed point from which to judge distance."

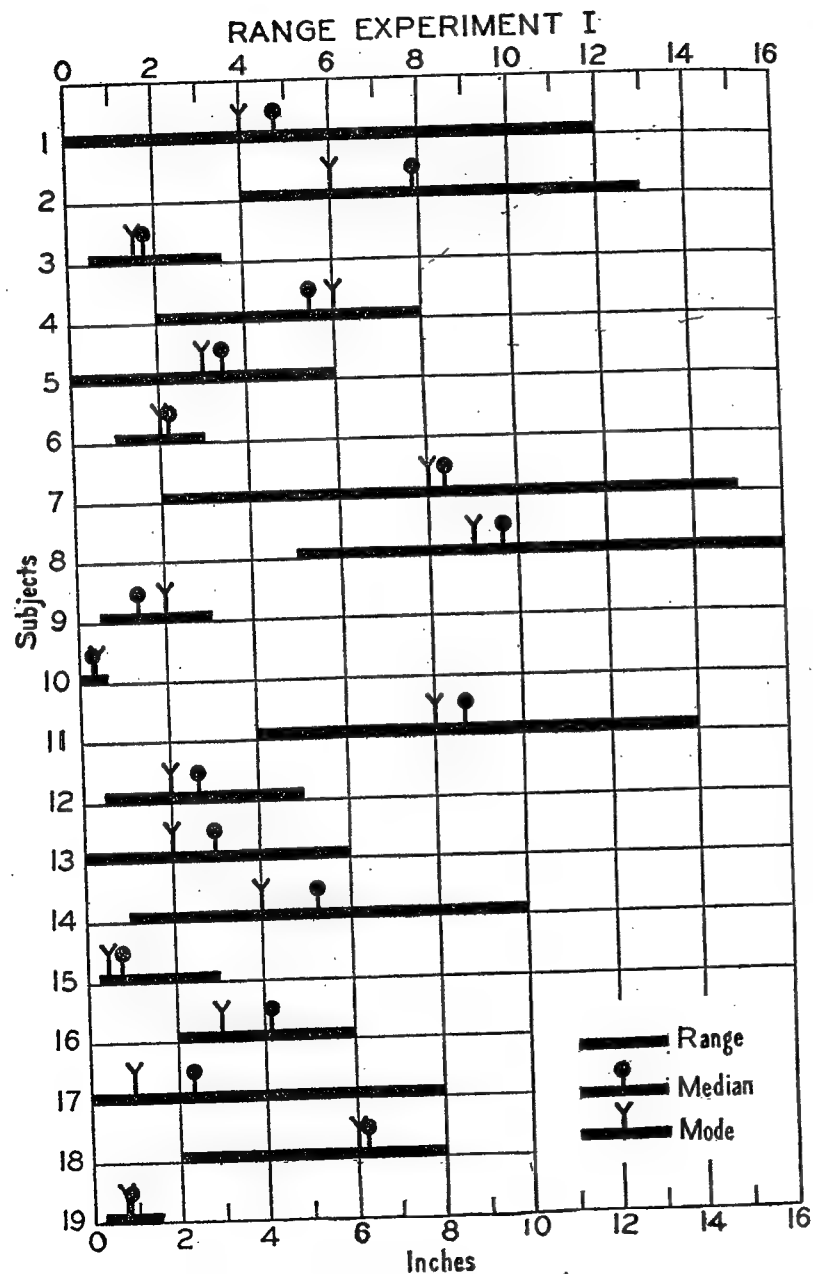
The answers given to the third question give a qualitative statement to support the conclusion reached on the basis of quantitative results, to the effect that they established a subjective basis of comparison. Some examples of the point are the following:

1. "Compared with previous distance."
2. "Judgments are all relative."
3. "Compared successive judgments."
4. "Approximated distance of spot from me, and used that."
5. "First estimate as standard."
6. "Thought of using radium dial of watch for judging distance."

We find this verification over and over again in the introspection obtained from the observers in the group experiments.

RANGE EXPERIMENT—PART II (INDIVIDUAL)

The special task of this experiment was to find whether, after once a range and a norm within that range are established, they



persist on subsequent occasions. In this part of the range experiment, 4 subjects were used. Instead of 100, 300 judgments were obtained from each subject, in three different sessions on different days within a week. The range, mode, median, Q, and P.E. (mdn.) for each 100 judgments are given in Table II, below. These results show that once a *range* and a *point* within that range are established, there is a tendency to preserve them in the subsequent sittings.

TABLE II
RANGE EXPERIMENT II

Subjects	Range	Mode	Median	Q	P.E. (Mdn.)
<i>One</i>					
I	4 (2-6)	3	3.62	.72	.09
II	5 (1-6)	3	2.95	.66	.08
III	5 (1-6)	3	3.37	.56	.07
<i>Two</i>					
I	2 (1-3)	2	1.66	.53	.07
II	3 ($\frac{1}{2}$ -3 $\frac{1}{2}$)	2	1.90	.52	.07
III	2 $\frac{1}{2}$ ($\frac{1}{2}$ -3)	2	1.61	.47	.06
<i>Three</i>					
I	5/8 (0-5/8)	3/8	.29	.10	.01
II	6/8 (1/8-7/8)	3/8	.46	.15	.02
III	6/8 (1/8-7/8)	2/8	.33	.11	.01
<i>Four</i>					
I	1 $\frac{1}{4}$ ($\frac{1}{4}$ -1 $\frac{1}{4}$)	3/4	.67	.20	.03
II	1 $\frac{1}{8}$ (1/8-1 $\frac{1}{4}$)	4/8	.55	.15	.02
III	1 $\frac{1}{8}$ (1/8-1 $\frac{1}{4}$)	5/8	.58	.13	.02

II. THE GROUP AS A FACTOR IN PERCEPTION

The facts in the above experiments led to the conclusion that: (1) every observer establishes a range of his own; (2) the judgments within that range are fairly normally distributed around a median value (norm). We started with the individual, to find out the individual reactions first. With the group experiments we extend our method to an important field of social psychology. The question becomes: What will a group do when confronting such an unstable situation? Will different individuals establish *their own* ranges and the norms within those ranges, or will the group establish a range (scale) of its own, and produce a norm (a median value) peculiar to itself? This involves one of the most debated questions in social psychology. We are concerned with the production of a new standard in a group (reminding us of "group mind")

theories), and with the idea of the arousal of a new *norm* in a group situation so well developed in Durkheim's "*Formes Élémentaires de la Vie Religieuse*."

A further question is this: How much convergence of ranges and medians (norms) will there be (a) when the individual in one session faces the situation alone and then is brought into the group situation; (b) when he faces the situation in the group first and then alone?

There were 8 groups of 2 subjects and 8 groups of 3 subjects. Four groups started with the individual situation (one session for each individual), and then functioned as groups. Four groups started as groups (3 sessions—all subjects of the group present in all 3), and were then broken up and studied in the individual situation. These arrangements are shown below. As before, 100 judgments were taken from each subject in each session.

Starting with the Individual Situation:

Session	I	II	III	IV
Individual	$\begin{Bmatrix} 1 \\ 2 \\ 3 \end{Bmatrix}$	Group	Group	Group

Starting with the Group Situation:

Session	I	II	III	IV
Group	Group	Group	Group	Individual $\begin{Bmatrix} 1 \\ 2 \\ 3 \end{Bmatrix}$

The general plan above holds true for the groups of 2 and 3 subjects.

The experimental setting in general is the same as in previous experiments. The exposure time (after the key is pressed) is the same. The head-rest was, however, not used, as the previous experiment showed us that it does not make much difference. As the subjects were new to the experimenter, he could not tell from the voice who was giving a judgment. Each subject pressed a push-button at the same time as he gave his judgment aloud. This push-button operated a signal light (yellow, red, or green as the case might be), which could be seen only by the experimenter, as it was separated by a partition from the vision of the subjects. It must be repeated that the colored light was very dim; it did not have intensity enough to make anything in the room visible. (See Chapter Two.)

The instruction sheet ran as follows:

"When the room is completely dark, I shall give you the signal *READY*, and then show you a point of light. After a short time

the light will start to move. As soon as you see it move, press the key. (Press it the moment you see the light move. Don't wait for the other persons.) A few seconds later the light will disappear. Then tell me the distance it moved. When you give your estimate, press the push-button. Try to make your estimates as accurate as possible."

This also describes the general procedure. After the subjects read the instruction sheets they were told that they could give their judgments in any order and they could change the order from time to time. In accordance with this, the subjects changed the order in which they gave their judgments during the course of the experiment. Each of the 100 judgments obtained from each subject in each session was written by the experimenter on a different sheet of a small pad and then torn off. As the subjects in the group were unknown to the experimenter and the experimenter could not recognize their voices, each subject's judgments were written down on a pad of a different color, corresponding to the color of the glow produced by the pressing of the push-button by each subject.

As will be noticed in the instructions, the subjects were left free as to the order in which they would give their judgments. This was done on purpose. The task set in the present study is to find what a group, consisting of people who have not established a relationship to each other, affective or otherwise, will do when they face such a novel field of stimulation. They were told at the start to give their judgments in random order, and to change the order in which they gave their judgments once in a while. Whether the judgments of the person who utters his judgments first have more influence than the others becomes a study in leadership which is a further interesting study.

In order to find out whether the subjects became conscious of the range and norm (median value) they established subjectively, the following questions were added:

Between what maximum and minimum did the distances vary? What was the most frequent distance the light moved? The similarity of these introspectively reported *ranges* and *norms* to the *ranges* and *norms* revealed by the computation of 100 judgments, would indicate how conscious the subjects became of the range and median established in the group. Also at the end of all the experiments the following question was added to the introspection blank to find out whether they were conscious of the influence of the group on their judgments: Do you think you were influenced in

your estimates by the judgments of the other persons in the experiment? The question: How did the light move? was eliminated from the introspection sheets, because if the subjects' attention were to be concentrated on the direction they would soon find out the discrepancy of the directions they experienced and thus come to the conclusion that it was an "illusion" after all. This was exactly the way that Schweizer found in 1858 that the movement of the stars on a dark night was an "illusion."

Results: The data were tabulated in frequency tables, each table representing 100 judgments for each individual subject in group and individual sessions. These results give an idea of the convergence and divergence of individuals (1) in individual sessions; (2) in group sessions, when first started with the group situation and then worked on individually, and (3) *vice versa*. As before, the range, mode, median, Q, and P.E. (mdn.) are worked out for each subject for each experimental session. The results obtained from the groups of three subjects are given in the Appendix (pp. 56-60). Results for the groups of two subjects show essentially the same trend. Since space is limited, these are not presented here.

The crucial point for our problem is to see from the results the comparison of ranges and norms (median values) when the individuals face the stimulus field under these conditions:

(a) First a subject's individual range and median are found for a whole session, and then he is put into the group to face the same situation (for three successive sessions) as a member of the group, so that we may note how much he converges toward a common range and median for the group.

(b) When the subject first faces the situation in the group (for three successive sessions on different days) and then faces the same situation alone in Session IV on a different day, *we note how closely he sticks to the common norm* established in group sessions. To give a concise picture, the median values (norms) established by each subject in each successive session are presented in the graphs on pp. 32-33.

Certain facts stand out in these tables and graphs. When subjects start with individual sessions the median values which they establish individually differ from each other considerably. When on successive sessions they work together their medians tend to converge—a "funnel-shaped" relationship, the opening of the funnel representing individual sessions. On the other hand, when subjects start in group situations there is convergence at once, which is main-

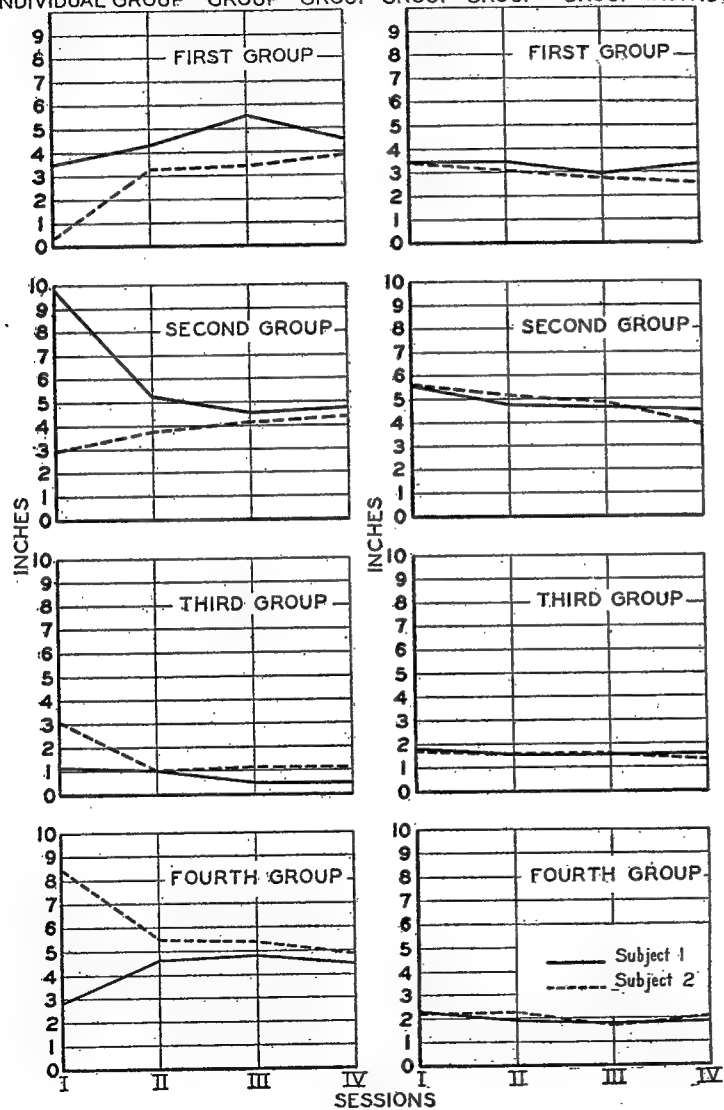
tained in successive sessions, including the last individual session. Groups of 2, starting with the group situation, tend to keep the same general level of median values in successive sessions. In groups of 3, starting with the group situations, there may be a rise or fall, as well as a keeping to the same general level in the median values, as seen in cases of the second and fourth groups. But when there is a rise the subjects rise as a whole, and they fall as a whole when they fall. The closeness of the medians of individuals in the group, which suggests the establishment of a common norm for the group in the cases of groups starting with the group situation, is a *very important fact that we wish to stress. Especially important is the fact that the divergence of the median values* established by the subjects in the individual session after the group sessions is small. Compared with this, when the subject starts with an individual session and then is brought into a group the convergence of the medians (see the funnel-shaped relationship) is not so close—suggesting that if an individual faces a stimulus situation and patterns it in his own way first, the group influence is not so dominating as when he faces the situation in the group first.

This point is subjected to a special analysis. The differences in the medians of each possible pair in each session and the reliabilities (critical ratio; $\frac{D}{PE \text{ (diff.)}}$) are computed. In addition to this, for groups starting with the group situation, the differences between the medians of the last (3rd session) group session and the individual session (4th session) were computed. *This is one of the crucial tests for our problem.* These results for all groups are presented in the tables on pp. 34-41. These results show that the differences of the medians of the pairs of subjects are very small in cases of groups starting with a group session, and are statistically unreliable. On the other hand, the differences between the pairs of subjects starting with the individual sessions are considerably larger and in many cases statistically reliable.

Also in groups starting with the group situation the differences between the medians of the last (Session III) group session and the individual session (Session IV) of each individual (designated as Self-D: self-difference) are small and statistically unreliable in most cases. This is, we repeat, an important point for social psychology, suggesting that once an individual faces a stimulus situation in the group situation for the first time and reacts to it with the norm of the group, *there is a tendency to continue to react to the same situ-*

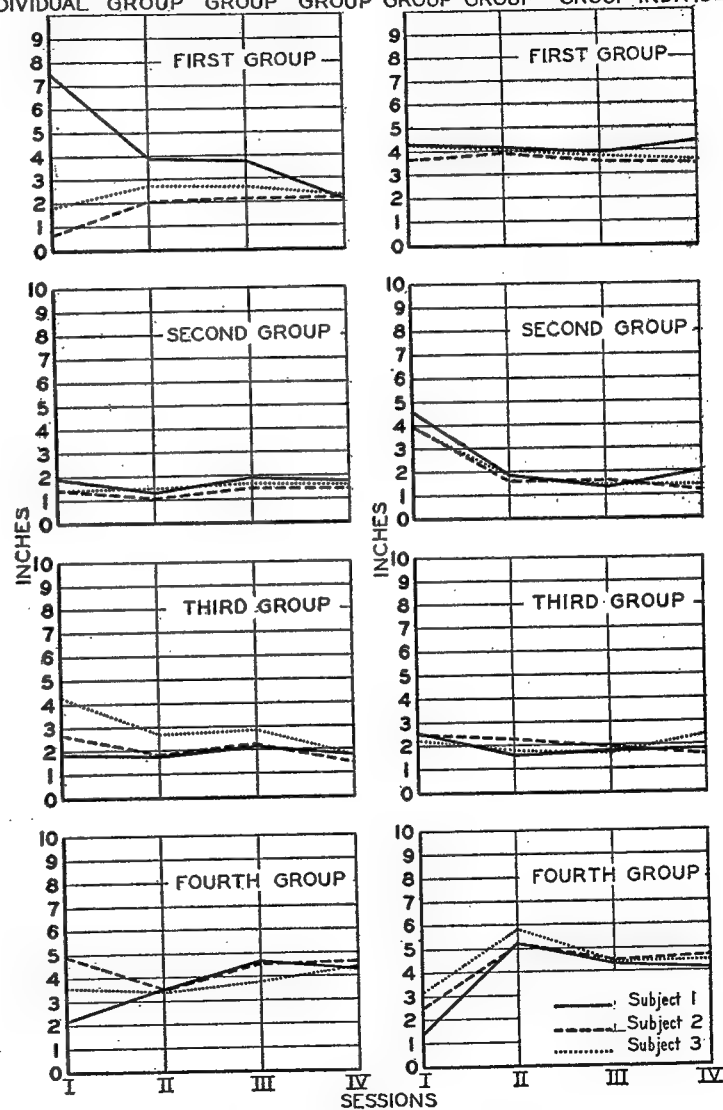
MEDIANS IN GROUPS OF TWO SUBJECTS

STARTING WITH INDIVIDUAL STARTING WITH GROUP
INDIVIDUAL GROUP GROUP GROUP GROUP GROUP GROUP INDIVIDUAL



MEDIANS IN GROUPS OF THREE SUBJECTS

STARTING WITH INDIVIDUAL STARTING WITH GROUP
INDIVIDUAL GROUP GROUP GROUP GROUP GROUP GROUP INDIVIDUAL



ation with the same norm established in the group, even when the subject is no longer in the group situation. No attempt has been made to make a careful analysis of the differences between the groups of 2 and 3 subjects. These two kinds of groups give essentially the same results.

TABLE III
DIFFERENCES BETWEEN MEDIAN AND CRITICAL RATIOS OF DIFFERENCES
OF PAIRS OF SUBJECTS
Groups of Two Subjects Starting with the Individual Situation

		Session	D ¹	$\frac{D}{\text{P.E. (Diff.)}}$
First Group	I Individual		3.12	45.93
	II Group		1.03	8.24
	III Group		2.12	9.22
	IV Group		.60	5.50
Second Group	I Individual		6.81	32.72
	II Group		1.50	9.61
	III Group		.41	3.04
	IV Group		.34	3.44
Third Group	I Individual		2.01	10.56
	II Group		.02	.35
	III Group		.76	12.64
	IV Group		.77	15.43
Fourth Group	I Individual		5.59	19.07
	II Group		1.19	7.14
	III Group		.54	5.15
	IV Group		.45	4.81

¹D represents the difference between the medians of the judgments of the two subjects in each group.

TABLE IV
DIFFERENCES BETWEEN MEDIAN AND CRITICAL RATIOS OF DIFFERENCES
OF PAIRS OF SUBJECTS
Groups of Two Subjects Starting with the Group Situation

		Session	D ¹	$\frac{D}{\text{P.E. (Diff.)}}$
First Group	I Group		.04	.05
	II Group		.35	2.34
	III Group		.19	1.67
	Self-D ² S1 (III-IV)		.37	3.08
	S2 (III-IV)		.17	1.31
Second Group	IV Individual		.73	5.75
	I Group		.05	.24
	II Group		.38	1.80
	III Group		.20	1.00
	Self-D S1 (III-IV)		.15	.75
Third Group	S2 (III-IV)		.98	5.19
	IV Individual		.63	3.31
	I Group		.02	.27
	II Group		.03	.75
	III Group		.02	.55
Fourth Group	Self-D S1 (III-IV)		.04	1.33
	S2 (III-IV)		.24	6.00
	IV Individual		.26	8.67
	I Group		.07	.63
	II Group		.35	3.05
Fourth Group	III Group		.05	.52
	Self-D S1 (III-IV)		.10	1.00
	S2 (III-IV)		.33	3.00
	IV Individual		.18	1.65

¹D represents the difference between the medians of the judgments of the two subjects in each group.

²Self-D (self-difference) represents the difference between the medians of the same subject in the last group session (Session III) and the individual session (Session IV).

TABLE V

DIFFERENCES BETWEEN MEDIAN AND CRITICAL RATIOS OF DIFFERENCES
OF PAIRS OF SUBJECTS
Group of Three Subjects Starting with the Individual Situation

	D	$\frac{D}{P.E. (Diff.)}$
<i>First Group</i>		
<i>Session I—Individual</i>		
S1-S2 ¹	6.84	38.00
S1-S3	5.67	31.50
S2-S3	1.17	23.40
<i>Session II—Group</i>		
S1-S2	1.89	9.94
S1-S3	1.15	6.77
S2-S3	0.74	5.36
<i>Session III—Group</i>		
S1-S2	1.67	11.92
S1-S3	1.14	8.27
S2-S3	0.53	5.30
<i>Session IV—Group</i>		
S1-S2	0.08	0.55
S1-S3	0.19	1.42
S2-S3	0.11	1.10

¹S1-S2 stands for the difference (D) of the medians of judgments of Subject 1 and Subject 2 in the group, etc.

TABLE VI

DIFFERENCES BETWEEN MEDIAN AND CRITICAL RATIOS OF DIFFERENCES
OF PAIRS OF SUBJECTS
Group of Three Subjects Starting with the Individual Situation

	D	$\frac{D}{P.E. (Diff.)}$
<i>Second Group</i>		
<i>Session I—Individual</i>		
S1-S2 ¹	1.78	14.81
S1-S3	0.50	3.83
S2-S3	1.27	21.28
<i>Session II—Group</i>		
S1-S2	0.27	5.60
S3-S1	0.18	2.54
S2-S3	0.45	9.06
<i>Session III—Group</i>		
S1-S3	0.49	6.13
S1-S3	0.26	2.83
S2-S3	0.23	2.50
<i>Session IV—Group</i>		
S1-S2	0.34	5.80
S1-S3	0.21	3.58
S2-S3	0.13	2.17

¹S1-S2 stands for the difference (D) of the medians of judgments of Subject 1 and Subject 2 in the group, etc.

TABLE VII

DIFFERENCES BETWEEN MEDIAN AND CRITICAL RATIOS OF DIFFERENCES
OF PAIRS OF SUBJECTS
Group of Three Subjects Starting with the Individual Situation

	D	$\frac{D}{P.E. (Diff.)}$
<i>Third Group</i>		
<i>Session I—Individual</i>		
S1-S2 ¹	0.82	6.31
S1-S3	2.42	14.24
S2-S3	1.60	12.31
<i>Session II—Group</i>		
S1-S2	0.09	.61
S1-S3	0.87	5.12
S2-S3	0.78	3.96
<i>Session III—Group</i>		
S1-S2	0.08	.40
S1-S3	0.66	5.07
S2-S3	0.58	2.76
<i>Session IV—Group</i>		
S1-S2	0.36	3.66
S1-S3	0.00	0.00
S2-S3	0.36	3.60

¹S1-S2 stands for the difference (D) of the medians of judgments of Subject 1 and Subject 2 in the group, etc.

TABLE VIII

DIFFERENCES BETWEEN MEDIAN AND CRITICAL RATIOS OF DIFFERENCES
OF PAIRS OF SUBJECTS
Group of Three Subjects Starting with the Individual Situation

	D	$\frac{D}{P.E. (Diff.)}$
<i>Fourth Group</i>		
<i>Session I—Individual</i>		
S1-S2 ¹	2.74	14.42
S1-S3	1.37	7.61
S2-S3	1.37	6.75
<i>Session II—Group</i>		
S1-S2	0.04	.27
S1-S3	0.15	.98
S2-S3	0.19	1.14
<i>Session III—Group</i>		
S1-S2	0.13	.57
S1-S3	0.90	5.00
S2-S3	0.77	4.52
<i>Session IV—Group</i>		
S1-S2	0.33	2.06
S1-S3	0.06	.41
S2-S3	0.27	1.71

¹S1-S2 stands for the difference (D) of the medians of judgments of Subject 1 and Subject 2 in the group, etc.

TABLE IX
DIFFERENCES BETWEEN MEDIAN AND CRITICAL RATIOS OF DIFFERENCES
OF PAIRS OF SUBJECTS
Group of Three Subjects Starting with the Group Situation

	D	$\frac{D}{P.E. (Diff.)}$
<i>First Group</i>		
<i>Session I—Group</i>		
S 1-S 2 ¹	0.65	4.64
S 1-S 3	0.01	.06
S 2-S 3	0.64	4.92
<i>Session II—Group</i>		
S 1-S 2	0.22	2.20
S 1-S 3	0.10	1.25
S 2-S 3	0.12	1.33
<i>Session III—Group</i>		
S 1-S 2	0.40	4.44
S 1-S 3	0.15	1.87
S 2-S 3	0.25	2.77
<i>Session III-IV (Self-D)</i>		
S 1 III-S 1 IV	0.47	4.27
S 2 III-S 2 IV11	1.10
S 3 III-S 3 IV19	2.37
<i>Session IV—Individual</i>		
S 1-S 2	0.98	8.16
S 1-S 3	0.81	6.70
S 2-S 3	0.17	1.88

Note:—S 1-S 2 stands for the difference (D) of the medians of judgments of Subject 1 and Subject 2 in the group, etc.
Self-D (self-difference) represents the difference between the medians of the same subject in the last group session (Session III) and the individual session (Session IV).

TABLE X
DIFFERENCES BETWEEN MEDIAN AND CRITICAL RATIOS OF DIFFERENCES
OF PAIRS OF SUBJECTS
Group of Three Subjects Starting with the Group Situation

	D	$\frac{D}{P.E. (Diff.)}$
<i>Second Group</i>		
<i>Session I—Group</i>		
S 1-S 2	0.59	2.70
S 1-S 3	0.67	3.20
S 2-S 3	0.08	0.38
<i>Session II—Group</i>		
S 1-S 2	0.27	2.07
S 1-S 3	0.05	0.38
S 2-S 3	0.22	2.00
<i>Session III—Group</i>		
S 1-S 2	0.24	2.17
S 1-S 3	0.07	0.63
S 2-S 3	0.17	1.55
<i>Session III-IV (Self-D)</i>		
S 1 III-S 1 IV	0.61	5.55
S 2 III-S 2 IV	0.45	5.00
S 3 III-S 3 IV	0.07	.63
<i>Session IV—Individual</i>		
S 1-S 2	0.82	9.11
S 1-S 3	0.61	5.55
S 2-S 3	0.21	2.21

Note:—S 1-S 2 stands for the difference (D) of the medians of judgments of Subject 1 and Subject 2 in the group, etc.
Self-D (self-difference) represents the difference between the medians of the same subject in the last group session (Session III) and the individual session (Session IV).

A STUDY OF SOME SOCIAL

TABLE XI
DIFFERENCES BETWEEN MEDIAN AND CRITICAL RATIOS OF DIFFERENCES
OF PAIRS OF SUBJECTS
Group of Three Subjects Starting with the Group Situation

	D	$\frac{D}{P.E. (Diff.)}$
<i>Third Group</i>		
<i>Session I—Group</i>		
S 1-S 2	0.03	.16
S 1-S 3	0.33	1.94
S 2-S 3	0.30	2.00
<i>Session II—Group</i>		
S 1-S 2	0.66	4.13
S 1-S 3	0.16	1.00
S 2-S 3	0.50	3.60
<i>Session III—Group</i>		
S 1-S 2	0.16	1.25
S 1-S 3	0.13	1.00
S 2-S 3	0.29	2.41
<i>Session III-IV (Self-D)</i>		
S 1 III-S 1 IV	0.06	0.55
S 2 III-S 2 IV	0.37	3.70
S 3 III-S 3 IV	0.72	6.00
<i>Session IV—Individual</i>		
S 1-S 2	0.27	3.00
S 1-S 353	4.82
S 2-S 3	0.80	8.00

Note:—S 1-S 2 stands for the difference (D) of the medians of judgments of Subject 1 and Subject 2 in the group, etc.
Self-D (self-difference) represents the difference between the medians of the same subject in the last group session (Session III) and the individual session (Session IV).

FACTORS IN PERCEPTION

TABLE XII
DIFFERENCES BETWEEN MEDIAN AND CRITICAL RATIOS OF DIFFERENCES
OF PAIRS OF SUBJECTS
Group of Three Subjects Starting with the Group Situation

	D	$\frac{D}{P.E. (Diff.)}$
<i>Fourth Group</i>		
<i>Session I—Group</i>		
S 1-S 2	1.10	2.90
S 1-S 3	1.73	4.80
S 2-S 3	0.63	1.90
<i>Session II—Group</i>		
S 1-S 2	0.02	0.09
S 1-S 3	0.58	2.31
S 2-S 3	0.60	2.42
<i>Session III—Group</i>		
S 1-S 2	0.19	1.10
S 1-S 3	0.16	0.72
S 2-S 3	0.03	0.14
<i>Session III-IV (Self-D)</i>		
S 1 III-S 1 IV	0.17	0.94
S 2 III-S 2 IV	0.20	0.95
S 3 III-S 3 IV	0.02	0.09
<i>Session IV—Individual</i>		
S 1-S 2	0.56	2.66
S 1-S 3	0.31	1.61
S 2-S 3	0.25	1.19

Note:—S 1-S 2 stands for the difference (D) of the medians of judgments of Subject 1 and Subject 2 in the group, etc.
Self-D (self-difference) represents the difference between the medians of the same subject in the last group session (Session III) and the individual session (Session IV).

CONCLUSIONS FROM INDIVIDUAL AND GROUP RANGE EXPERIMENTS

We may summarize these results in a few words: When individuals face this new and unstable situation *first* individually and *then* in a group, each establishes a range and a norm (standard) within that range; the range and the norms tend to converge when the subjects come into a group situation. But the convergence is not as close as when they start with the group situation first.

When individuals face this new, unstable situation as members of a group for the first time, a range (a scale) and a norm (standard) within that range are established which are peculiar to the group, and *afterwards* when they face the same situation alone they stick to the range and norm established in the group.

INTROSPECTIONS

The introspections from these group experiments verify the points that came out in the introspections in the individual range experiment as to the experience of the lack of reference points.

In closing this section we cannot help giving a very interesting case of a group of 3 starting with the group situation. The subjects in the fourth group of three starting with the group situation gave an unusually large number of zero judgments in Session I with modes at zero for all three subjects. After filling the introspection blank one subject asked, "Was the light moving really?" The experimenter, not knowing what to say, asked, "Why?" The subject answered that in some cases he tried to put his finger between his eye and the light, and the light did not cross the finger.

Before Session II started with the same group the experimenter told them not to move any part of their bodies during the experiment. The mode rose to 4 in all three cases and kept that level throughout, including the individual sessions for each of the three subjects. The first session is definitely a case of polarization around one person. After all the experiments were over the experimenter asked this particular subject to write down his position in the educational institutions with which he was connected. He reported that he was president of his college fraternity, manager of the football team, etc. As can be seen readily, the case of this particular group contains good suggestions for new "prestige" experiments.

To the question: "Do you think you were influenced by the judgments of the other persons in the experiments?" appearing on the sheets at the end of the last session, comparatively few (about 25%) answered that they were. People do not have to be aware of the fact that *they are* being influenced by the group situation.

The last point has to do with the time relationships of the group influence. Are the subjects influenced by each judgment at the moment it is given by some other member of the group, or does the effect arise gradually throughout the experiment? The serial inspection of our results shows that it is largely a temporal affair, not a question of one particular exposure, though at times this may happen.

III. SUGGESTION AS A FACTOR IN PERCEPTION

We had occasion to refer to the fact that a single point has no definite locus; it cannot be located at any definite place. It is experienced to move in an erratic way because it has no definite direc-

tion. But when a definite attitude is taken it is experienced to move in the direction given by the attitude. In the previous experiment the influence of a group on the perception of the extent of the autokinetic movement for a short time was studied. In the present experiment our task is to study the influence of suggestion on the *direction* of the movement.

It is reported by those who have worked on autokinetic movement that the direction is variable, and that voluntary control is possible, (Bourdon, Charpentier, Carr, Adams). In this experiment we tried to induce this voluntary control by suggestion. Adams has already tested the influence of suggestion on three naive subjects:

"These subjects, who were much interested in abnormal psychology, were told that the illusion was a new form of planchette which would form any simple figure or letter which they thought of while fixating the light. With one of the subjects, the suggestion worked perfectly, only one failure being made in 62 trials. The letters and figures were not always in their proper positions, sometimes being inverted, or suffering other displacements, but in all but one case, the desired letter or figure was formed. The subject was much surprised at this failure.

"The other two subjects had difficulty in getting the illusion at first, but when they succeeded in obtaining it, the desired letter was formed in 80% of the cases." (1, pp. 41-42.)

In our preliminary experiments in 1932, different directions were suggested at different times during the same experimental session. It was found that the subject has the tendency to stick to the direction suggested in the first part of the experiment. Therefore in the main experiments only one direction was used throughout the whole session. The general set-up and procedure of this experiment were the same in general outline as described in the previous range experiment. *Right* and *left* directions were used exclusively (up and down might just as well be used). The instructions ran as follows:

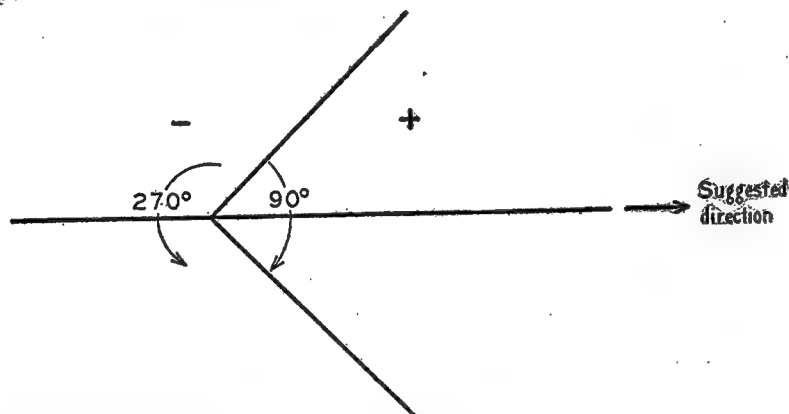
FOR RIGHT INSTRUCTION

When the room is completely dark I shall show you a point of light. After a short time it will start to move to your *right*. As soon as you see the light move, press the key. A few seconds later the light will disappear. Then tell me the distance it moved. Try to make your estimate as accurate as possible.

For *left* direction *left* was substituted for the word *right*. We intentionally led the subject to think that the experiment was concerned with his sensitivity in estimating the distance which the light

moves, because one of the essential conditions in a suggestion experiment is not to give the idea that one is being given a suggestion. Fifty exposures were made in each session. A longer period in a pitch-dark room might produce negativism. The subjects were not asked to report the direction in addition to distance at each exposure, to avoid arousing any suspicion on their part that the direction is important. At the end of 50 trials, *among other questions* the subject was asked to make a diagram of the direction, and approximate frequency distribution if he drew more than one direction. During the experiment the subjects did not say anything about direction if they "perceived" the movement in the expected direction. Almost invariably they reported spontaneously if they "perceived" the movement in any other direction.

The criteria adopted for the tabulation of results were as follows: The area around a point of origin was divided into four quadrants. If the diagram drawn by the subject fell within the quadrant of the suggested direction, this result was considered positive (showing the effect of the suggestion). The following diagram will make the point clear:



If *right* suggestion was given the diagram or diagrams falling within the quadrant at the right were considered positive; that is, showing the influence of suggestion. Diagrams falling outside that quadrant were considered negative. The opposite 90° degree quadrant was used as the criterion for the *left* suggestion; diagrams falling within that 90° degree area were considered positive. Knowing the fact that the light may move in any direction, this three-to-one criterion is a fair one.

The first part of the experiment was carried on in 1932 in the psychological laboratory of the Gazi Teachers College, Ankara, Tur-

key. There were 20 subjects, male students in the Institute. Each subject was used for only one session. Ten subjects were given *right* directions and 10 subjects *left*. The results are given in Table XIII.

TABLE XIII
DIRECTION RESULTS IN MOVEMENT EXPERIMENT

Subject	Suggested Direction	+	-
1	Right	45	5
2	"	41	9
3	"	31	19
4	"	50	0
5	"	43	7
6	"	7	43
7	"	39	11
8	"	47	3
9	"	50	0
10	"	42	8
11	Left	49	1
12	"	48	2
13	"	35	15
14	"	50	0
15	"	50	0
16	"	50	0
17	"	50	0
18	"	10	40
19	"	50	0
20	"	50	0
		837	163

Out of 1,000 judgments, 837 were reported in the direction suggested and 163 outside of the suggested direction.

The second part of the experiment was carried on at Harvard Psychological Laboratory in 1933. The set-up, procedure and instructions were essentially the same. There were originally 8 subjects. Each subject was used in two separate sessions, at least one week apart, to do away somewhat with the effect of the previous direction. If *right* direction was suggested in the first session, *left* direction was suggested in the second session. One subject, a graduate student, could not come for the second session. Therefore his results are discarded. The results are presented in Table XIV.

The third part of the experiment was conducted at the Columbia Psychological Laboratory in the summer of 1934. Set-up, procedure, instructions and the arrangement of sessions were essentially the same as in the Harvard experiments. Ten subjects were used, two sessions with each, with one *right* and one *left* direction as indicated in the table. The results are given in Table XV.

TABLE XIV

Subject	Session I			Session II		
	Suggested Direction	+	-	Suggested Direction	+	-
1	L	40	10	R	48	2
2	R	50	0	L	50	0
3	R	45	5	L	32	18
4	L	50	0	R	50	0
5	R	47	3	L	30	20
6	L	50	0	R	50	0
7	R	50	0	L	0	50
		332	18		260	90

The sum of the positive and negative results (as defined above) was taken. The data were not subjected to further statistical treatment, because each judgment was not given separately. At the end of the experiment the subject made a general statement about the number of times the light moved in each direction.

TABLE XV

Subject	Session II					
	Suggested Direction	+	-	Suggested Direction	+	-
1	L	12	38	R	50	0
2	R	49	1	L	50	0
3	L	50	0	R	9	41
4	L	50	0	R	0	50
5	R	50	0	L	50	0
6	L	49	1	R	48	2
7	L	50	0	R	50	0
8	R	47	3	L	0	50
9	R	50	0	L	1	49
10	R	0	50	L	37	13
		407	93		295	205

On the basis of these results one may conclude:

In general, suggestion is effective in giving definite direction to an indefinite, unstable stimulus situation. The number of negative judgments in the second sessions, when a direction opposite to the first is suggested, is definitely larger than in the first sessions. This may be due to the influence of the first session. When some subjects perceive direction once in a definite way as determined by suggestion, they keep on perceiving the movement in that direction in spite of the change of the instructions in the new session, thus showing perseveration.

CHAPTER IV

PRESTIGE-SUGGESTION AS A FACTOR IN PERCEPTION

Until now our studies have been concerned primarily with the perceptual material which demonstrated the influence of the group through suggestion. We have used laboratory material of a sort which is not found commonly in actual social life, but which, nevertheless, demonstrated the psychological processes in such cases. In the present study we shall try to see how the psychological phenomena involved in the frame-of-reference concept may be applied to a concrete problem of prestige-suggestion. Our task in the present chapter is to make the subjects face similar situations, which in themselves do not possess differential affective value, and note how names with differential prestige value pull judgments up or down.

Experimental studies have already been reported that show the definite influence of stereotypes on perception and affective ratings. Goring (14), while testing Lombroso's criminal-type theory, showed how the stereotyped way of linking high forehead with high intelligence influenced the judgments about the foreheads of 300 British convicts made by warden and prison physician—two persons who see them every day!

Our likes and dislikes create a correspondingly favorable or unfavorable "picture in our minds." Taking advantage of this phenomenon, Rice (35) presented newspaper pictures to his subjects and asked them to connect the pictures with some label representing well-established stereotypes in American society. He found wide displacements. For example, a Soviet leader was labeled as a U. S. Senator and vice versa. Farnsworth and Beaumont (11) presented to their subjects pictures from the works of "unknown" painters with a paragraph of praise or devaluation attached to each. These paragraphs affected the rankings. Zillig (43), a German school teacher, first ascertained who among the pupils were considered favorites, and who were most disliked by their classmates. She instructed the former to do the wrong thing deliberately. In a short gymnastic period, she asked a mixed group to lift their right hands, but, as instructed in advance, the favorite pupils did the wrong thing. However, not they, but the disliked ones were reported by the other pupils to have done the wrong thing.

Our study proceeds from these results. Our experiment was begun at Harvard Psychological Laboratory in 1931. The experiment was repeated in three successive years on different subjects. There were 228 subjects in all in three experiments.

I

A mimeographed sheet containing the names of sixteen authors arranged in alphabetical order (Barrie, Joseph Conrad, James Fenimore Cooper, Dickens, Thomas Hardy, Hawthorne, Kipling, Poe, Ruskin, Scott, Stevenson, Thackeray, Tolstoy, Mark Twain, Walt Whitman, Thornton Wilder) was presented to the subjects with the following instructions at the top of the sheet:

"Place beside each name a figure indicating the order of preference you have for the following authors. Make your judgment solely on the grounds of subjective liking for the words of the writer. If you have no feeling of like or dislike for a certain author, you may omit his name. Place the figure (1) beside the name of the writer whose work you like best, (2) beside the next, and so on until you have arranged all with whom you are acquainted."

These ratings were designated as Series A.

One month later the same subjects were given sixteen mimeographed slips each containing a short passage of three or four lines and, so far as three judges could determine, of about the same literary value. Under each passage was placed the name of one of the sixteen authors used in the first part of the experiment. Each passage was ascribed to a different author, but in reality all the passages were taken from one author, namely, Robert Louis Stevenson. No subject suspected the deception. The instructions for the second part of the experiment were as follows:

"Attached are sixteen descriptive passages with the authors' names. Kindly arrange these in order of your preference by inserting a figure (1) at the left of the passage which appeals to you most. Make your judgments simply on the grounds of liking or disliking of the passages. Place (2) against the next most pleasing passage. If it is difficult to distinguish closely between the different passages, you are asked simply to "guess" if no more accurate judgment is possible."

These ratings were designated as Series B.

After the ratings in Series B were completed a written introspective report was secured from each subject, as to whether he or

she had made a special effort to eliminate the influence of the author's names in evaluating the passages, either by covering them while the judgments were being made or by intentionally disregarding them.

The correlation between the order of preference for authors (Series A) and the judgment of the literary merit of the passages ascribed to the same authors (Series B) was calculated for each subject. Correlations were computed by the Spearman rank order formula.

The results are classified into two groups on the basis of the introspective reports of the subjects: (1) those who did *not* make a special effort to overcome the influence of the authors' names; (2) those who did make a special effort to overcome this influence.

In the Harvard group there were 33 subjects. 25 of these did *not* make a special effort to overcome the influence of the authors' names or to ignore them altogether. For this group the average correlation between liking of authors and liking of passages bearing their names was +.45. 8 subjects made a special effort to overcome the influence of the authors' names or to ignore them altogether. The average correlation for this group was -.30. At Radcliffe there were 19 subjects. 11 subjects came under Group I, and the average correlation for this group was +.53. There were 8 subjects in Group II, and the average correlation was +.04.

The fact that the results obtained from those who had made a special effort to overcome the influence of the authors' names gave practically zero correlation shows that the *intrinsic* value of the passages was not a factor working in any direction. In contrast with this, the positive correlations (+.45 in the case of Harvard; +.53 in the case of Radcliffe) obtained from those who took a natural attitude, indicate the influence upon the evaluations exerted by the names attached to the passages.

II

The second experiment was carried on in the psychological laboratory of Gazi Teachers College, Ankara, Turkey, the following year. In general the procedure followed the Harvard experiment with certain slight modifications and controls.

Here again all the passages were taken from one single author. Twelve Turkish authors' names and twelve passages were used. As a control the passages were prepared in two forms. In both forms the passages were the same, but the names of the twelve authors were

distributed in a different order, so that a different author's name appeared under the corresponding passages of Forms I and II. The subjects were students of four different colleges. In each case the first form was given to one-half of the group and the second form to the other half. This was done as a control to check upon the influence of the intrinsic literary value that any passage might have.

This experiment was carried out on 106 subjects; 67 subjects were male and 39 female. The records of a few subjects who reported that they deliberately ignored the names of the authors were discarded. The correlations may be summarized as follows: The average correlation for 67 male subjects was +.46. The average correlation for 39 female subjects was +.50.

Between the correlations from Forms I and II there were no significant differences. Therefore one may conclude, as in the first experiment, that the intrinsic value of the passages did not play a part in giving these correlations.

III

The third experiment was carried on at Harvard two years after the first experiment. 70 subjects were used; 29 students from Harvard, 20 from Radcliffe, 9 from the School of Education, and 12 adults attending an extension course. The results from these last two groups are combined because they are comparable.

To make the results comparable with the first experiment the same material was used. The procedure was the same, but the same control as in the second experiment was used. That is, the material was prepared in two forms as a check upon the intrinsic value of the passages. The results here also indicate that the correlations were not influenced by the intrinsic value of the passages. The results obtained from the subjects who did not make a consistent effort to overcome the influence of the authors' names or to ignore them altogether are as follows:

Average correlation for 32 Harvard students +.33.

Average correlation for 17 Radcliffe students +.45.

Average correlation for 18 adult students +.30.

There were nine subjects who simply ignored the names of the authors. The average correlation for these nine subjects is +.03. Therefore the results of the third experiment correspond with the results of the first and second experiments.

On the basis of these experiments it may be concluded that prestige-suggestion or stereotype plays a considerable part in peoples'

judgments. In other words, the attitudes towards authors serve as reference points. Authors rated high tend to pull up the rating of the passages attributed to them, and conversely, authors rated low tend to pull down the ratings of the passages attributed to them. This is but a specific case of a general psychological principle. *It appears that our judgments, like our perceptions, are organized in relation to definite reference points or in relation to a general level of reference.*

In the written introspective records obtained right after the experiments, several subjects *spontaneously* reported they "wished that the names of the authors were not there," or that they "were irritated by the presence of the author's name." Such emotional remarks indicate that the point of reference which causes the bias is sometimes a matter of considerable concern to the subject himself.

Inspection of the introspections further illustrates the effect shown in the correlations. In fact, in some cases the introspections show definitely why some correlations are high and some are low, following the operation of the same principle of frame of reference in opposite directions. A few of the most interesting cases follow:

A subject who gave very low correlation wrote, "I did not make any effort *not* to be prejudiced. *But I simply disregarded the authors' names attached.*" (Emphasis by the subject.)

A shift in the frame of reference causes a corresponding shift in evaluation. One subject reported that "I made an effort not to be prejudiced by the name of the author, Mark Twain excepted. I was prejudiced *against* him in judging his selection. I had just made a critical study of his writings." The correlation obtained from this subject is .26, but when Mark Twain is excluded from the computation, his correlation rises to .61. In the first series Mark Twain was ranked as 2 (next to the highest); in the second series the passage attributed to Mark Twain is rated as 16, the lowest.

Cases of this sort present something to be taken into consideration seriously by those who are working on attitude and personality traits. With the shift in value or value system (frame of reference), a corresponding shift in the attitude and even of the general level of attitude may follow. Similarly, a person with an ascendant "trait" may be submissive in equal degree in a different frame. Lewin has recently shown brilliantly how people manifesting some definite "trait" in a social environment may drop it when the properties of the new situation are altogether different.

Out of 228 subjects, only one suspected the deception of the passages. She was a student majoring in social psychology and wrote, "I decided the names of the authors were all mixed up, so I just had to rely on my aesthetic judgment." Her correlation was $-.28$.

SUMMARY

This paper is an approach to the study of differential responses determined by social factors when the individuals face the same stimulus situation. Such social determination of differential responses is amply found in the observations of cultural anthropologists. Individuals belonging to different cultures may react in widely different ways to the same objective stimulus situation. These differences, for our purpose, may be expressed as due to differences of subjective values and norms (frames of reference). The importance of the concept of reference point (frame of reference) is seen in the results of many psychological investigations in different fields. Evidence suggests that we may be dealing with a general psychological concept.

In many cases the objective situation is dominant in the determination of perception. There are cases, however, in which this objective determination is lacking, thus allowing the internal factors, such as attitude, subjective norms, and values to play the dominating rôle in the organization of the perceptual field.

Since in the autokinetic effect we find such an indefinite stimulus-situation and hence subjective uncertainty and instability, this effect was used in a series of experiments to study the influence of various social factors. If the subject's reports show consistency in a particular experiment, this may be taken as an index of the influence of the social factor experimentally introduced. In these experiments such factors as instruction by the experimenter, direct suggestion, group influence, and prestige-suggestion (in the author's experiment) were used.

In the range experiments the subjects estimated the extent of the movement repeatedly. It was found that in the absence of an objective range (scale) and reference points, the subject builds up his own range (scale) and reference point (norm) within that range in the course of the experiment.

When two or three individuals give their judgments in the presence of each other (group situation) the whole group establishes a range and a point of reference peculiar to the group. A norm once

established in a group situation persists in the individual member even when he faces the same situation *alone* subsequently.

When individuals who have established their individual norms in separate experimental sessions are later put into a group situation, their points of reference converge towards a common norm, representing a "funnel-shaped" relationship. But convergence in this case is not as great as in groups starting with the group situation.

Instructions by the experimenter suggesting a definite direction for the autokinetic movement serve to emphasize this direction in the perceptual field. In most cases the subjects perceive the movement in the suggested direction.

Authors' names which were ascertained to have definite prestige-value for the subjects were attached to short prose passages which in themselves were affectively undifferentiated. Prestige-suggestion given by the author's name served to increase or decrease the perceived value of the passage in the direction of the prestige-value of the authors.

It is suggested that these experiments furnish some insight into the psychological basis of some important phenomena in social psychology. Stereotypes, fads and fashions, customs, traditions, and attitudes are, psychologically, cases of the establishment of socially determined norms and values serving as frames of reference.

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APPENDIX

TABLE XVI	PAGE
Frequency Distributions of the Judgments of Extent in the Range Experiment (Individual). See p. 24.	55-56
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NOTES—Within the range in which the judgments are distributed, the subjects do not always use units of inches that follow regular arithmetical progression. For example, instead of evenly spaced units, (1, 2, 3, 4, 5) a subject might use $\frac{1}{2}$, 1, $1\frac{1}{2}$, 2, 3, 4, 5. Such cases are not numerous. But when this happens, usually the unevenly spaced fractions get small frequencies as compared with the whole numbers, thus causing irregularities in the frequency distributions. In such cases the data are computed as they were given by the subjects.

TABLE XVI
RANGE EXPERIMENT—PART I—(INDIVIDUAL)
FREQUENCY DISTRIBUTION OF JUDGMENTS OF DISTANCES

S1		S2		S3		S4		S5	
x	f	x	f	x	f	x	f	x	f
0-2	2	4-4	4	$\frac{1}{2}$ -6	6	2-2	2	0-2	2
1-2	2	5-7	7	$\frac{3}{4}$ -10	10	3-14	14	$\frac{1}{2}$ -8	8
2-6	6	6-23	23	1-21	21	4-24	24	1-8	8
3-20	20	7-18	18	$1\frac{1}{2}$ -30	30	5-22	22	2-18	18
4-25	25	8-16	16	2-18	18	6-29	29	3-31	31
5-10	10	9-10	10	2 $\frac{1}{2}$ -8	8	7-8	8	4-25	25
6-22	22	10-12	12	3-2	2	8-1	1	5-7	7
7-3	3	11-1	1	3 $\frac{1}{2}$ -5	5			6-1	1
8-3	3	12-6	6						
9-4	4	13-3	3						
10-2	2								
12-1	1								

S6		S7		S8		S9		S10	
x	f	x	f	x	f	x	f	x	f
1-42	42	2-2	2	5-1	1	$\frac{1}{2}$ -33	33	0-1	1
2-49	49	3-0	0	6-4	4	1-23	23	$\frac{1}{8}$ -6	6
3-9	9	4-7	7	7-13	13	$1\frac{1}{2}$ -10	10	$\frac{1}{4}$ -20	20
		5-7	7	8-19	19	2-26	26	$\frac{1}{2}$ -27	27
		6-15	15	9-21	21	2 $\frac{1}{2}$ -3	3	$\frac{3}{8}$ -32	32
		7-12	12	10-17	17	3-5	5	$\frac{1}{2}$ -12	12
		8-18	18	11-11	11			$\frac{5}{8}$ -2	2
		9-14	14	12-10	10				
		10-9	9	13-0	0				
		11-5	5	14-2	2				
		12-4	4	15-1	1				
		13-3	3	16-1	1				
		14-2	2						
		15-2	2						

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TABLE XVI—(Contd.)
RANGE EXPERIMENT—PART I—(INDIVIDUAL)
FREQUENCY DISTRIBUTION OF JUDGMENTS OF DISTANCES

S11		S12		S13		S14		S15	
x	f	x	f	x	f	x	f	x	f
4-2		$\frac{1}{2}$ -5		0-2		1-1		$\frac{1}{2}$ -21	
5-8		1-20		$\frac{1}{2}$ -7		2-6		$\frac{1}{2}$ -27	
6-12		$1\frac{1}{2}$ -3		1-15		3-14		$\frac{2}{3}$ -19	
7-14		2-36		2-27		4-26		1-15	
8-20		3-21		3-22		5-14		$1\frac{1}{2}$ -12	
9-11		4-11		4-13		6-20		2-4	
10-15		5-4		5-7		7-9		$2\frac{1}{2}$ -1	
11-6				6-7		8-8		3-1	
12-6						9-1			
13-3						10-1			
14-3									

S16		S17		S18		S19	
x	f	x	f	x	f	x	f
2-11		0-14		2-8		$\frac{1}{2}$ -18	
3-35		1-28		4-29		$\frac{1}{2}$ -26	
4-34		2-22		6-52		$\frac{3}{4}$ -33	
5-15		3-20		7-7		1-17	
6-5		4-5		8-4		$1\frac{1}{2}$ -2	
		5-4				$1\frac{1}{2}$ -4	
		6-6					
		8-1					

TABLE XVII
GROUP OF THREE SUBJECTS STARTING WITH THE INDIVIDUAL SITUATION

GROUP OF THREE SUBJECTS WITH						
First Group		Range	Mode	Median	Q	P.E. (Mdn.)
Subject 1						
Session						
I	Individual	13 (1-14)	7	7.50	1.46	± .18
II	Group	8 (0-8)	3	3.90	1.22	± .15
III	Group	8 (0-8)	3	3.78	.92	± .12
IV	Group	5 (0-5)	1	2.10	.97	± .12
Subject 2						
Session						
I	Individual	1½ (½-2)	1	.66	.26	± .03
II	Group	6½ (½-7)	3	2.01	.95	± .12
III	Group	4 (1-5)	2	2.11	.59	± .07
IV	Group	3½ (½-4)	1½	2.18	.61	± .08
Subject 3						
Session						
I	Individual	3 (0-3)	2	1.83	.35	± .04
II	Group	5 (0-5)	3	2.75	.59	± .07
III	Group	3 (1-4)	3	2.64	.56	± .07
IV	Group	3½ (½-4)	2	2.29	.44	± .06

Note:—Results for groups of two subjects show essentially the same trend, although the numerical values may differ. These are not reproduced because of space limitations.

TABLE XVIII
GROUP OF THREE SUBJECTS STARTING WITH THE INDIVIDUAL SITUATION

Second Group						
		Range	Mode	Median	Q	P.E. (Mdn.)
Subject 1						
Session						
I	Individual	5 (0-5)	1½	1.92	.93	± .12
II	Group	2½ (½-3)	1	1.31	.43	± .05
III	Group	3½ (½-4)	2	1.94	.50	± .06
IV	Group	2½ (½-3)	1½	1.79	.35	± .04
Subject 2						
Session						
I	Individual	⅝ (⅛-¾)	½	0.14	.04	± .01
II	Group	1½ (½-2)	1	1.03	.19	± .02
III	Group	2½ (½-3)	1	1.45	.45	± .06
IV	Group	2 (½-2½)	1½	1.45	.30	± .04
Subject 3						
Session						
I	Individual	3½ (½-4)	1½	1.42	.45	± .06
II	Group	2½ (½-3)	1½	1.49	.40	± .05
III	Group	4½ (½-5)	1	1.68	.54	± .07
IV	Group	3½ (½-4)	1½	1.58	.41	± .05

TABLE XIX
GROUP OF THREE SUBJECTS STARTING WITH THE INDIVIDUAL SITUATION

Third Group						
		Range	Mode	Median	Q	P.E. (Mdn.)
Subject 1						
Session						
I	Individual	6 (0-6)	1	1.84	.93	$\pm .12$
II	Group	5.5 (.5-6)	1	1.76	.62	$\pm .08$
III	Group	3.5 (.5-4)	2	2.17	.76	$\pm .09$
IV	Group	2.5 (.5-3)	1	1.79	.48	$\pm .06$
Subject 2						
Session						
I	Individual	5 (1-6)	2	2.66	.49	$\pm .06$
II	Group	4 (0-4)	0.5	1.85	1.01	$\pm .13$
III	Group	5 (0-5)	2	2.25	1.47	$\pm .18$
IV	Group	4 (0-4)	1	1.43	.68	$\pm .08$
Subject 3						
Session						
I	Individual	7 (1-8)	4	4.26	1.03	$\pm .12$
II	Group	5 (0-5)	2	2.63	1.22	$\pm .15$
III	Group	5.5 (.5-6)	3	2.83	.78	$\pm .10$
IV	Group	4.5 (.5-5)	2	1.79	.48	$\pm .06$

TABLE XX

GROUP OF THREE SUBJECTS STARTING WITH THE INDIVIDUAL SITUATION

Fourth Group					
	Range	Mode	Median	Q	P.E. (Mdn.)
Subject 1					
Session					
I Individual	5 (0-5)	2	2.20	.54	± .07
II Group	6 (0-6)	3	3.51	.76	± .09
III Group	7 (1-8)	4	4.69	1.40	± .17
IV Group	4 (2-6)	4	4.29	.83	± .10
Subject 2					
Session					
I Individual	7 (1-8)	4	4.94	1.41	± .18
II Group	6 (0-6)	3	3.55	.93	± .12
III Group	7 (1-8)	4	4.56	1.10	± .15
IV Group	6 (1-7)	4	4.62	.95	± .12
Subject 3					
Session					
I Individual	10 (0-10)	3	3.57	1.40	± .17
II Group	7 (0-7)	2	3.36	.96	± .12
III Group	6 (1-7)	3	3.79	.60	± .07
IV Group	6 (1-7)	4	4.35	.85	± .11

TABLE XXI

GROUP OF THREE SUBJECTS STARTING WITH THE GROUP SITUATION

First Group					
	Range	Mode	Median	Q	P.E. (Mdn.)
Subject 1					
Session					
I Group	5 (2-7)	4	4.30	.87	± .11
II Group	4 (2-6)	4	4.13	.53	± .07
III Group	4 (2-6)	4	3.92	.38	± .05
IV Individual	5 (2-7)	4	4.39	.76	± .10
Subject 2					
Session					
I Group	5 (2-7)	3	3.65	.74	± .09
II Group	4 (2-6)	4	3.91	.58	± .07
III Group	3 (2-5)	4	3.52	.56	± .07
IV Individual	3 (2-5)	3	3.41	.55	± .07
Subject 3					
Session					
I Group	5 (2-7)	4	4.29	.76	± .10
II Group	4 (2-6)	4	4.03	.43	± .05
III Group	3 (2-5)	4	3.77	.46	± .06
IV Individual	3 (2-5)	4	3.58	.51	± .06

TABLE XXII

GROUP OF THREE SUBJECTS STARTING WITH THE GROUP SITUATION

Second Group					
	Range	Mode	Median	Q	P.E. (Mdn.)
Subject 1					
Session					
I Group	7 (1-8)	5	4.55	1.27	± .16
II Group	4 (0-4)	1	1.85	.80	± .10
III Group	4 (0-4)	1	1.39	.65	± .08
IV Individual	4 (0-4)	2	2.00	.67	± .08
Subject 2					
Session					
I Group	7 (1-8)	4	3.96	1.21	± .15
II Group	5 (0-5)	1	1.58	.64	± .08
III Group	3 (1-4)	2	1.63	.56	± .07
IV Individual	1 (1-2)	1	1.18	.36	± .05
Subject 3					
Session					
I Group	7 (1-8)	4	3.88	1.10	± .14
II Group	5 (0-5)	2	1.80	.66	± .08
III Group	4 (0-4)	1	1.46	.62	± .08
IV Individual	3 (1-4)	1	1.39	.60	± .08

TABLE XXIII

GROUP OF THREE SUBJECTS STARTING WITH THE GROUP SITUATION

Third Group					
	Range	Mode	Median	Q	P.E. (Mdn.)
Subject 1					
Session					
I Group	6 (0-6)	2	2.55	1.16	± .14
II Group	3.5 (.5-4)	2	1.60	1.01	± .13
III Group	5 (0-5)	1	1.79	.72	± .09
IV Individual	2.5 (.5-3)	1	1.85	.55	± .07
Subject 2					
Session					
I Group	7 (0-7)	1	2.52	.93	± .12
II Group	3.5 (.5-4)	2	2.26	.77	± .09
III Group	4 (0-4)	1	1.95	.66	± .08
IV Individual	3 (0-3)	1	1.58	.51	± .06
Subject 3					
Session					
I Group	5 (0-5)	1	2.22	.75	± .09
II Group	5 (0-5)	1	1.76	.84	± .10
III Group	4 (0-4)	1	1.66	.67	± .09
IV Individual	4 (0-4)	2	2.38	.66	± .08

TABLE XXIV
GROUP OF THREE SUBJECTS STARTING WITH THE GROUP SITUATION

<i>Fourth Group</i>					
	<i>Range</i>	<i>Mode</i>	<i>Median</i>	<i>Q</i>	<i>P.E. (Mdn.)</i>
<i>Subject 1</i>					
Session					
I Group	10 (0-10)	0	1.44	2.30	$\pm .29$
II Group	10 (0-10)	4	5.25	1.21	$\pm .15$
III Group	6 (1-7)	4	4.31	0.98	$\pm .12$
IV Individual	7 (0-7)	4	4.14	1.02	$\pm .13$
<i>Subject 2</i>					
Session					
I Group	10 (0-10)	0	2.54	2.00	$\pm .25$
II Group	9 (0-9)	4	5.23	1.22	$\pm .15$
III Group	7 (1-8)	4	4.50	1.04	$\pm .13$
IV Individual	8 (0-8)	3	4.70	1.27	$\pm .16$
<i>Subject 3</i>					
Session					
I Group	10 (0-10)	0	3.17	1.72	$\pm .21$
II Group	10 (0-10)	4	5.83	1.58	$\pm .20$
III Group	7 (1-8)	4	4.47	1.48	$\pm .18$
IV Individual	6 (1-7)	4	4.45	1.15	$\pm .14$